AN EMPIRICAL STUDY TO OBSERVE AND EVALUATE MANAGEMENT INFORMATION SYSTEMS SUCCESS IN A DOMESTIC BANK

A THESIS

SUBMITTED TO THE DEPARTMENT OF MANAGEMENT

AND THE GRADUATE SCHOOL OF BUSINESS ADMINISTRATION

OF BILKENT UNIVERSITY

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE

DEGREE OF MASTER OF BUSINESS ADMINISTRATION

By

ÖZLEM ALBAYRAK

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I certify that I have read this thesis and in my opinion it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Business Administration.

Assist. Prof. Serpil Sayın

I certify that I have read this thesis and in my opinion it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Business Administration.

Assist. Prof. Dilek Önkal

I certify that I have read this thesis and in my opinion it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Business Administration.

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ABSTRACT

AN EMPIRICAL STUDY TO OBSERVE AND EVALUATE

MANAGEMENT INFORMATION SYSTEMS SUCCESS

IN A

DOMESTIC BANK

ÖZLEM ALBAYRAK

Master of Business Administration

Supervisor : Assist. Prof. SERPİL SAYIN

June 1994, 96 pages

The main purpose of this thesis is to observe and evaluate the interrelationships of MIS users' involvement and users' system satisfaction. To do that İŞBANK's management information systems has been considered as the sample MIS environment. Questionnaire measuring MIS users involvement and satisfaction levels were conducted as well as pre-interviews with the different MIS user groups at İŞBANK. After the questionnaires post-interviews were conducted to better analyze the subject. Based on the feedback from pre-interviews, the relationships between various measures have been studied. Both statistical and non-statistical results of the study are represented in the thesis.

Keywords : MIS, MIS user involvement, MIS user satisfaction

ÖZET

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ÖZLEM ALBAYRAK

Yüksek Lisans Tezi, İşletme Enstitüsü

Tez Yöneticisi : Yar. Doç. SERPİL SAYIN

Haziran 1994, 96 sayfa

Bu çalışmanın amacı Yönetici Bilgi Sistemlerinde sistem başarısı ile kullanıcı katılımı arasındaki ilişkileri incelemektir. Bu amaçla İŞBANKASI Bilgi İşlem Sistemi baz alınmış, kullanıcı katılımı ile sistemden memnuniyetleri arasındaki ilişkileri ölçme amacıyla anketler ve öngörüşmeler yapılmıştır. Anket sonrası görüşmelerle konuyu daha iyi analiz etme amaçlanmıştır. Çalışmada anketler ve görüşmelerden elde edilen sonuçlar gerek istatiksel gerekse yorumsal çıkarımlar halinde değerlendirilmiştir.

Anahtar terimler : MIS, kullanıcı memnuniyeti, kullanıcı katılımı

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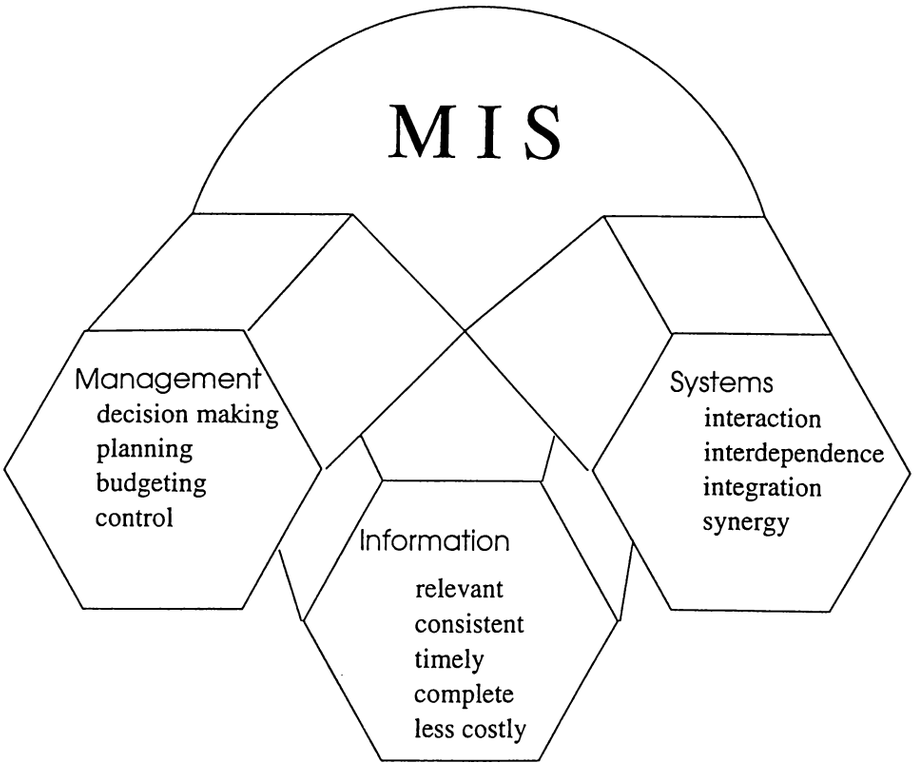


Figure 1: MIS concept : a function of management, information and systems

1 INTRODUCTION

Since the main purpose of this study is to observe the interrelationships between involvement and satisfaction of MIS[1] users, understanding of MIS concept intended in this study is required at the first step. Hence, we start with the intended definition of MIS in the study.

Early definitional problems associated with MIS include many disagreements over what an MIS is and is not. At one extreme, MIS is defined as a Computer Based Information System, (CBIS), producing expanded set of reports and has a query capability. At the other extreme, MIS is said to serve everyone's organizational information needs. The

[1]Management Information Systems

confusion of MIS definition, either closer to Data Base Management Systems (DBMS), or Decision Support Systems (DSS) has been already discussed in the literature (Spiegler 1980, Naylor 1982, Watson and Hill, 1983).

Having mentioned the extreme definitions of MIS, one should talk about a third class of MIS definitions. This class combines the previous definitions, which seem conflicting, at least different. Wysong thought of MIS as a system both to support managerial decision making (a DSS), and to support day- to-day activities in individual functional areas (Wysong, 1985).

In this study, MIS is referred to in the sense of Wyong's definition. Hence, before we proceed, it is appropriate to study the Wysong model of MIS.

In order to place in context the role of MIS within an organization, Wysong looked at the terms involved in MIS : management, information and systems (Figure 1).

1.1 Management

As a term, management implies not only a process by which certain activities are performed but also people administrating the process. In the development of MIS, there are some general axioms :

- the system should relate to the organizational internal structure,
- the system should tie in the planning and budgeting process to provide basis for comparison and control.

The system should provide management information which :

- is necessary to exercise control over operations,
- provides early warning of developing problems,
- indicates remedial actions required,
- enables management to correct interpretation of financial and other statistics,
- enables management to allocate organizational resources effectively and efficiently.

1.2 Information

Information is necessary not only for day-to-day operations and performance analysis, but also for tracking progress toward long-term strategic goals. Information can be considered as a vital resource in the business world and managed as so. It consists of a body of knowledge which reduces uncertainty about future happenings.

"The general connotation of information is that it is the result of gathering, classifying, recording, analyzing, sorting, interpreting, and presenting data selectively in a format that is useful and timely" (Wysong, 1985).

"The provision ... of information is not a numbers game, with the winner delivering the largest stack of paper" (Brophy, 1986). This suggests that not all the information supplied is useful to management. "The information produced by MIS must be such that it aids decision-making and helps managers to execute their responsibilities effectively"

(Wysong, 1985). Hence, for information to be high quality it must have the following characteristics : (Wysong 1985, Brophy 1986).

Relevance : Information submitted to management must be relevant. Irrelevant information reduces productivity. Hence, careful analyses should be performed in selecting which information is relevant to which decision.

Reliability and Consistency : Reliability and consistency of information are key factors in achieving successful decision-making process. Regardless of the kind of transactions on it, data must be consistent at all levels of an information system.

Timeliness : If the information does not arrive on time, it may generate circumstances that are very difficult, even impossible to correct. Hence, information should be submitted on time, and this is a vital determinant of information quality.

Completeness : In many circumstances, incomplete information may cause even worse events than events caused by lack of information. Completeness of information is highly related to the decision to which the information pertains. Ideally, managers must use all the information required to make a decision; however, in real life it is hard to satisfy this. In some cases, all of the information required may not be available, yet in some others, only part of the available information can be gathered. As a result, most of the times only partial sets of required information is submitted to the managers. To the extent that the information is complete, the quality of it increases.

Cost : Although gathering, storing and processing information are all costly, information itself should carry value to the decision makers. There are always different ways of

obtaining the same information, hence different costs. The less costly way of obtaining the same information characteristics should be preferred.

1.3 Systems

Common to all systems are organization, interaction, interdependence, integration, and a central objective. According to the general systems theory, all systems have the following characteristics:

- systems are designed to accomplish a certain objective (or set of objectives which may change throughout time),
- objectives of individual elements are less important than the overall systems objectives, just like the output and the process of the overall system is more valuable than that of basic elements,
- there exists an established arrangement of systems elements,
- interrelationships among individual elements are synergistic.

Channels for the movements of resources through a system are provided by communication. Hence, communication plays the role of a vital element in the whole systems. Information being the main resource of management information systems, requires high utilization of communication channels in the system.

"... The important aspect is that information systems development is now in a language that management can and must understand." (McAulay, 1993). But there are still some problems in this language as stated in Cash (1992). Those problems mainly originate from the different knowledge bases of the sides, as well as their different backgrounds. "To communicate among each others, information technology specialists use words as bits, bytes, DOS, CICS, and so on, which are highly opaque to general managers. General Managers, conversely, have a quite different language that includes such terms as sales growth, return on investment, and productivity, terms that are opaque to the information technology specialists "(Cash, 1992).

To the extent communication problems among MIS users and information technology specialists (software developers, system designers,...) are decreased, information systems can be more effective and efficient use of systems will be provided. Certainly, new information analysis methodologies, software and hardware technologies will help to close the gap between MIS users and MIS technology specialists.

Having mentioned about the individual terms involved in MIS, now it is time to define the MIS concept intended in this study.

1.4 MIS : Management Information Systems

Most of the previous definitions of MIS failed to respond some questions about MIS, because MIS was considered as a *product* in the past. However, MIS is not a product, it is a *concept* (Wysong 1985), and the concept that will be referred throughout this study

is parallel to the definition by Walter Kennevan (1970) :

" A Management Information System is an organized method of providing past, present, and projected information related to the internal operations and external intelligence. It supports the planning, control, and operational function of an organization by furnishing uniform information in the proper time frame to *assist the decision maker.* "

In Chapter 2, the problems addressed in this study will be defined. In Chapter 3, a literature review will be given. Chapter 4 contains a description of how the study was conducted. Our findings are given in Chapter 5. Finally Chapter 6 contains a brief summary, conclusions and directions for further research.

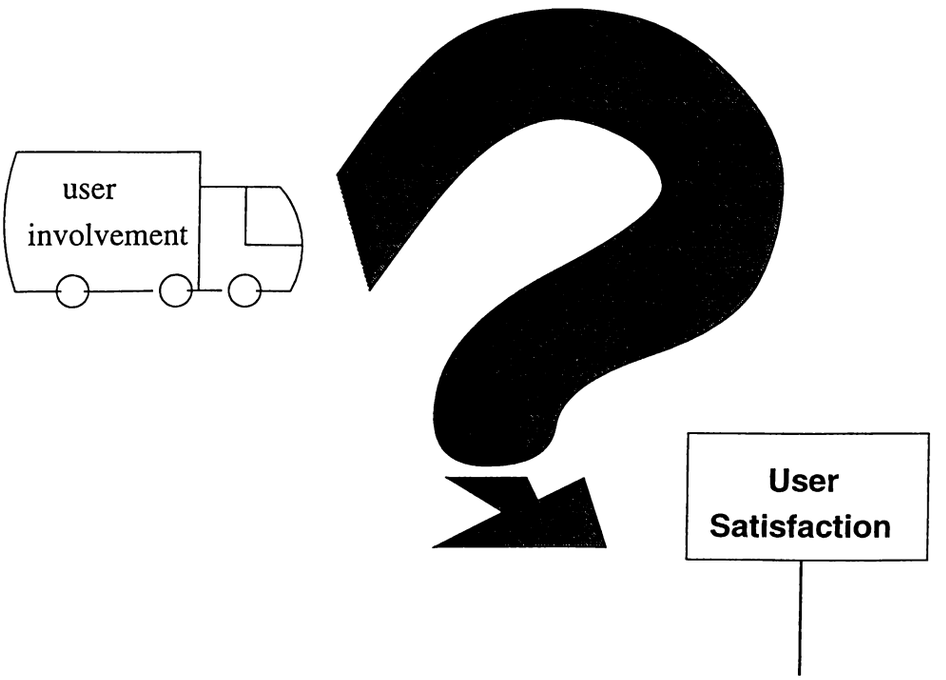


Figure 2: Can user involvement be a medium to reach user satisfaction ?

2 PROBLEM DEFINITION

The main purpose of this study is to observe and evaluate interrelationships among MIS users' involvement -both in participation and commitment meanings, and their satisfactions with the system. A list of questions that will be addressed is given below :

- Is there a relation among MIS users' involvement and their satisfaction with the system ? Does the basic axiom claiming that user information satisfaction increases as users are involved in the MIS system hold in our domain ?
- How can user information satisfaction and involvement be measured ?
- To what extent users expectations are fulfilled?

- Are users' and EDP[2] staff's perceptions of user involvement in MIS similar ?
- What is the degree of MIS user involvement in different phases of system development?
- How effective is the power asymmetry in fulfilling the expectations?
- What factors affect user satisfaction ?
- What are the users' general attitudes and behaviors about MIS?
- At which levels, are there communication gaps between the users and information technology specialists?
- What are the mechanisms in identifying users' requirements?
- Are there mechanisms to encourage users to be involved in system development? Are all of the users aware of these mechanisms ?
- Would users prefer to work without computers ? (attitudes)
- What is the importance given to MIS?

[2]Electronic Data Processing

3 LITERATURE REVIEW

In this section previous studies in MIS literature are reviewed. First, the concept of MIS intended in this study is given. Then in the following subsection, an overview of the research on user satisfaction and user involvement is presented.

3.1 MIS Concept

In this section the emergence of MIS and the overall evolution of empirical research in Information Systems will be explained.

MIS Emergence : There has been an ongoing discussion on the definition and the concept of MIS in the literature. These discussions were mainly caused by controversial functionalities or different uses of MIS in the organizations. Some argued that MIS was more like a DBMS (Database Management System), which is closer to computer science. Still others considered MIS as a DSS (Decision Support System), closer to management and decision science, while some others claimed that MIS is more like CBIS (computer based information system) that provides and controls information flow in the organizations, closer to organization science.

Given the above considerations, the discussions on MIS definitions should no more be unexpected. Moreover, the emergence of MIS can be explained by these three related fundamental fields of studies : computer science, management science, and organization science (Culnan and Swanson, 1986).

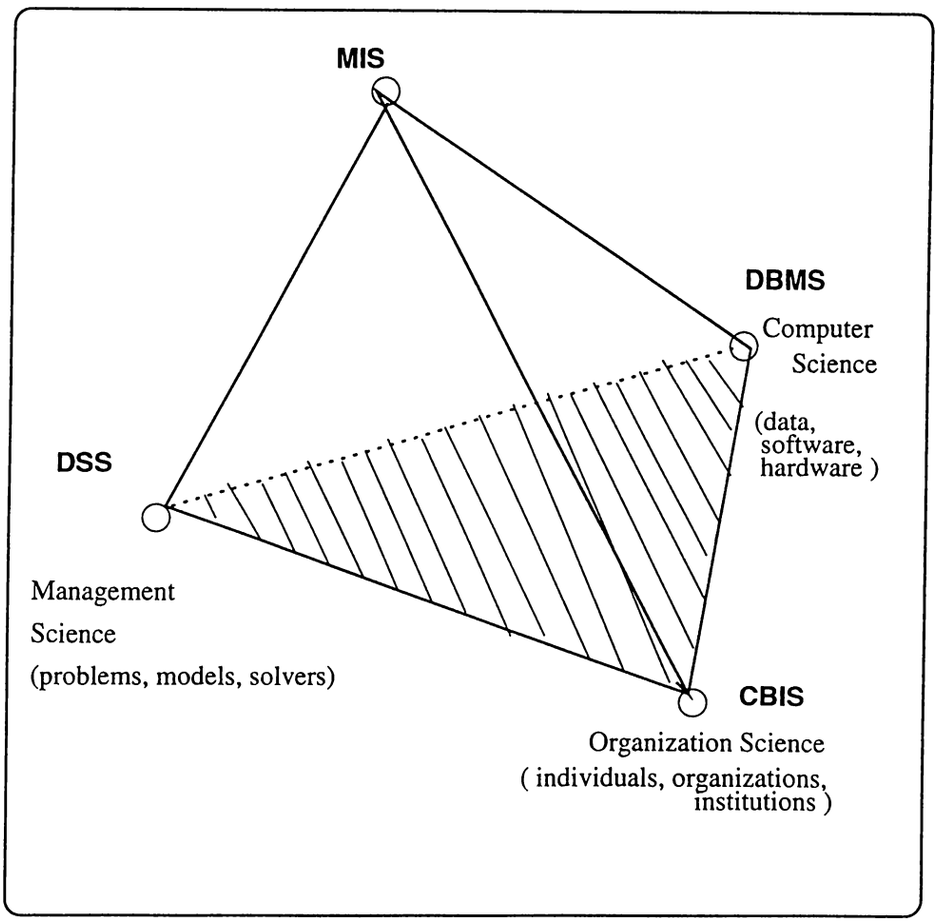


Figure 3: MIS and its foundational base

At present, most scholars agree that MIS is an interdisciplinary field of endeavor. Davis suggests that MIS represents the intersection of six fields of knowledge (Davis, 1984). In addition to the three sciences in the framework of Swanson, behavioral science, organizational function, and management accounting were also suggested.

These three foundation fields form a triangular base (Figure 3). Actually, the top point, named as MIS, is flexible. It may move in the space according to the requirements of organizations. MIS, as a distinct field of study is seen as evolving from work contained within the foundational base, to work defining a point lying above the plane of the base. To the extent it differentiates itself from the base, MIS becomes a unique field of study.

Computer science focuses mainly upon three components ; data, software and hardware. Every organization produces data about basic facts of their organizations in daily activities. These facts, which mean data, are not more important than un-processed raw materials for manufacturing firms. If data is not processed correctly by the software and hardware combinations, it is of no value for the organization. Rather it may mean heavy, meaningless junks.

A possible analogy can be applied to this concept. One can consider data as un-processed petroleum found in the nature. Before applying the necessary processes to it, finding the place of the petroleum, gathering and refining, it does not provide any value for the human. Before the inventions of refinery, and usage areas of it, petroleum just stays there, just like data stays as basic facts. In this analogy, software matches with some characteristics of refinery. Data is turned into reports, interpretations can be made. In other words, "helpful information" is generated for the use of organizations, just like petroleum can be turned into fuel oil, oil, etc...Hardware, in turn establishes architectural parameters for data and software, besides, it provides the vehicle for organizational employment of both. This is similar to cars, other transportation or heating media using processed oil.

Management science (MS), as an approach to managerial decision making that is based on specific methodology, makes extensive use of quantitative analysis. MS is mainly concerned with *problems, models* and *solvers.* Foundation of MS goes back to early 1900's though modern MS is generally considered to have originated during World War II. The most significant development was the discovery of the simplex method for solving linear

programming problems.

By the help of computers and methodological developments, virtual explosion of the MS field occurred. Models are used to express real situations in more structured and formal languages. In other words, models are representations of real objects or situations. In general, experimenting with models requires less time and cost than experimenting with real objects or situations. MS models are used to solve real life problems in organizations. They provide the computational technology by means of which models are addressed and explored. Decision makers sometimes refer to these models to solve actual problems. Output of solvers will help them in their decision making processes. Hence, some of the scientists considered MIS closer to DSS.

3.2 User Involvement and User Satisfaction in MIS

Users know about systems through experiencing them. Their knowledge is gained in the course of working with the system in either day-to-day transactions, or in making decisions. User knowledge is experiential knowledge , which is a special way of knowing and thinking. It is knowledge that is concerned with the immediate realities of one's situation, not with abstract theories about systems.

At an individual level, user knowledge is related to a person's needs to learn and develop. It is almost a certain and well-known fact that, when referred, user knowledge provides an abundant source of information about systems, although system analysts and/or developers usually perceive user knowledge as largely subjective. To the most of

them, it exists in forms that are not realistic, not ordered, not systematic, not necessarily rational and not consistent over time.

On the other hand, users may perceive MIS specialists as being self oriented, and not listening to the users. Table 1 consists of two possible extreme scenarios that may arise in the organizations having MIS ; user dominant scenario and MIS staff dominant scenario (Cash, 1992).

Whatever the degree of dispute among the user and the MIS specialists is, it can be said that user knowledge about the system in use and MIS in general is an important source of information for implementing successful MIS applications. It helps to picture user expectations from MIS.

Actually, user expectations can be used as predictors of project success or failure. Ginzberg claimed that to the extent that users hold realistic assumptions about the systems, they are more satisfied with the system and use it more than users whose pre-implementation expectations are unrealistic. (Ginzberg, 1987). In Figure 4, Ginzberg's proposed chain to MIS success is given.

How can one claim that users expectations are unrealistic ? This question is not an easy-to-answer one. Although it is a fact that more knowledged users have generally more realistic assumptions about systems, measuring the degree of users expectations' realism is not a clear and well-defined process. In his study, Ginzberg used expert's expectations as basis to measure the realism of user's expectations. Further, the results of his study suggest that in addition to the experts (system development personnel),

IT dominance	User dominance
Too much emphasis on database hygiene	Too much emphasis on problem focus
All new systems must fit the existing data structure Standardization dominates	Lack of standardization and control over data hygiene and systems
IT designs and controls everything Benefits of user control over development discussed but never implemented	IT says out of control Technical advice of IT not sought; if received, considered irrelevant
No recent new supplier or distinct services	Multiple suppliers delivering services
IT thinks they are in control of all Users express unhappiness No strong user groups exists General Management not involved but concerned IT specializing in technical frontiers, not user oriented markets	Growth in duplication of technical staff Few measurements/ objectives for new systems No coordinated effort for technology transfer or learning experience between users Hard evidence of benefits nonexistent Dramatically rising communication costs because of redundancy User building networks to own unique needs, not to corporate need

Table 1: Possible implications of Excess IT and User Dominance

user management who played active role during system definition can also provide the benchmark expectations against which the realism of users' expectations can be judged.

Throughout the emergence of MIS, a large portion of the MIS studies has been devoted to finding ways to implement successful systems so that users will be satisfied and will refer to the system in their jobs. Reasons of system success and failure have been searched parallel to the studies analyzing factors making systems successful or unsuccessful (Ives and Olson, 1983). If high speed is found as a factor making an MIS successful, then ways to increase system's speed have been searched.

Several methods have been proposed for having better MIS in different stages of MIS development. Evaluations of those methods, pros and cons of them were studied by different scientists (Alter 1976, Batiste and Jung 1983, Shank and Zmud 1985, Markus 1983, Nutt 1986, Kendall 1987, Mansuy 1989).

Common to almost all of those studies is the existence of communication gap between MIS users and system development specialists as a major factor for not having successful MIS. This gap is thought to be filled mostly when users are involved in the different stages of MIS development.

Mansuy's evolutionary development strategy is one of the studies that tries to close this gap. He claimed that problems caused by lack of user involvement will disappear when his proposed development strategy for MIS is used (Mansuy, 1989). He stated that management information systems should be built to be modified to meet the user's needs, which usually change faster than the time it takes to build systems using the traditional

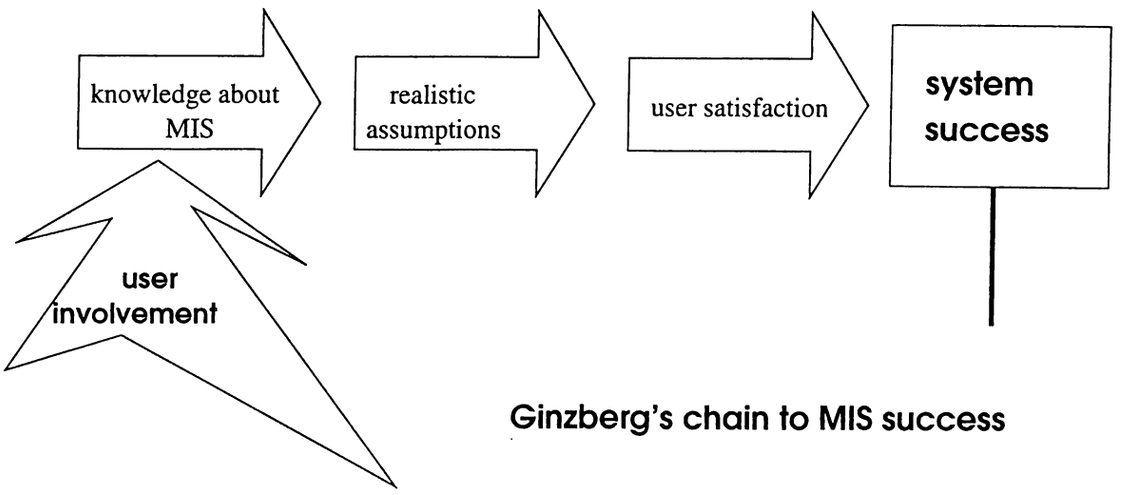


Figure 4: Realistic assumptions increase user satisfaction

approaches.

Mansuy's proposed strategy permits more user involvement in the management information systems development. Hence, he claimed that evolutionary development strategy (his proposed strategy) allows the MIS developer to adopt to the user's environment, rather than forcing the user to adopt to the traditional MIS development process.

Generating tools for measuring user involvement as well as user satisfaction and systems success have occupied considerable portion of the previous MIS studies (Ives and Olson, 1984). Table 2 presents the previous MIS studies on user involvement, while Table 3 summarizes user satisfaction measures (Ives and Olson, 1983).

1. Questionnaires self rated			
Study	**Variable Label**	**Method of Measurement**	**Comments**
Ference & Uretsky 1976	Top Management Involvement	Multiple item "forced choice"	
Franz 1979	User- Manager Influence	Multiple item behaviorally anchored	For design & implementation
Fuerst 1979	User involvement	Single-item Likert -type scale	
Gallagher 1974	Participation	Dichotomous measure	
Guthrie 1972	Participation Index	Single item open ended, coded as low medium or high	Users "expressed philosophy"
Igersheim 1976	User involvement	Six item, likert type scale	
Kaiser & Srinivasan 1980	User involvement	Tree item, likert type scale	
Lucas 1975	User involvement	Two item, likert type scale	
Lucas 1976	User involvement	Single item, likert type scale	
Maish 1979	User involvement	Single item, behaviorally anchored	
Olson & Ives 1981	User Involvement	Multiple item, likert type scale	Also included ratings by EDP
Robey & Farrow 1979	Participation	Single item, likert type scale	Initiation, design & implementation
Sartore 1976	Participation	Behaviorally anchored	
Schewe 1976	Involvement in System Development	Single item, bipolar scale	
Spence 1978	Pre implementation involvement Post implementation involvement	Two item scale Two item scale	Also included ratings by EDP
Swanson 1974	A priori involvement	Ten item, likert type scale	Possible compound with system usage
Zmud 1981	Involvement role sets	Single item, likert type scale	

Table 2: Measurement of user involvement(continues in the next page)

2. Questionnaires, multiple raters			
Study	**Variable Label**	**Method of Measurement**	**Comments**
Edstrom 1977	Influence	Single item bipolar scales	repeated for 6 phases, four raters
3. Interviews			
Alter 1978	Initiation Participation	Interview-dichotomous classification Interview-dichotomous classification	
Powers & Dickson 1973	Participation -Operating Management Users on Project Team User Initiation	Interviews Interviews Interviews	
Thurston 1959	Specialists vs Operating Personnel	Classification	
Vanlommel & DeBrabander	Organizational Involvement Pattern User Project Involvement	Classification Classification	EDP ratings scales for design and implementation
4. Experimental manipulation			
Boland 1978	Traditional design protocols versus mutual interactions	Simulated System design problem	
King & Rodriquez 1978, 1981	Participation	Dichotomous manipulation	

Table 2: Measurement of user involvement

A user satisfaction measurement test can achieve to account for 100% of the variance. However, there is always the possibility of producing more satisfaction for users by computers. Limits of satisfaction can only be drawn by limits of creativity. Hence, any measurement of satisfaction is limited by this measurement's boundaries. This is what Mathieson claims in "Measuring Satisfaction" , the story of Bogon the gnome whose hobby was the measurement of user satisfaction (Mathieson, 1986).

Before and after Mathieson's Bogon, scientists have attempted to develop instruments to measure user satisfaction in MIS literature. (Bailey and Pearson 1983, Kendall 1987, Nath 1989, Melone 1990). It is possible to divide MIS literature into three phases of study.

In the first phase, the definition of user information satisfaction, as well as identification of variables affecting it were established. Ives (1983) defined user information satisfaction as the extent to which users believe their information systems meet their information requirements. In light of this definition, and identification of the variables affecting the level of user satisfaction, the second phase has been initiated.

In the second phase, some hypothesis were generated about the relations of some variables (user involvement, system quality, system success, perception of systems by users , system usage rate, etc...) with the user information satisfaction. As a result, almost an axiom of MIS literature has been reached : "User involvement is a necessary condition for MIS user satisfaction and system success."

"User participation is critical to the success of the MIS project" (Powers and Dickson, 1973).

1. Measures of system quality			
Study	**Variable Label**	**Method of Measurement**	**Comments**
Boland 1078	Performance	7 Scales	
Gallagher 1974	Perceived value of reports	Dollar estimates	
King and Rodriquez 1978 1981	Decision making performence	Expert evaluations	
Powers & Dickson 1973	Cost to develop	Historical records	
Sartore 1976	Performance	7 scales	Objective
Thurston 1959	Time to complete	Historical records	
Vanlommel & DeBrabander 1975	Economic benefits Improvements in IS	7 item likert type scale 6 item, likert type scale	Rated by EDP also
2. Measures of system usage			
King & Rodriquez	Amount of use	Number of system queries Measure not described	Objective
Lucas 1975,1976	Reported use	Single item	
Fuerst 1979	Use of system and general MIS	User estimates	
Schewe 1976	System usage	monthly request # for activity base information	Objective
Swanson 1974	Inquiry involvement	Monitored single indicator	Objective
3. Measures of perceived quality/information satisfaction			
Edstrom 1977	Perceived success of IS	Single item, bipolar scale	Multiple rates
Franz 1979	Perceived success of IS	Multiple item , likert type	
Gallagher 1974	Information satisfaction	15 item, semantic differential scale	

Table 3: Measurement of user satisfaction (continues in the next page)

3. Measures of perceived quality/information satisfaction (continued)			
Study	**Variable Label**	**Method of Measurement**	**Comments**
Kaiser & Srinivasan	Information systems success	Two item likert type scale	
Maish 1979	Feeling about IS	Five item, bipolar scale	
Olson and Ives 1981	IS quality	Four item, likert type scale	
Powers and Dickson 1973	User satisfaction	Not described	
Sartore 1976	Satisfaction	12 item, likert type scale	
Spence 1978	MIS satisfaction	3 item, likert type scale	
Swanson 1974	MIS appreciation	16 item likert type scale	
4. Measures of changes in user behaivor/attitudes			
Alter 1976	Resistance	Interview-dichotomous class.	
Edstrom 1977S	Change in ways	Interview-dichotomous class.	
Guthrie 1972	Felt need for information	Multiple item, difference scale	
Igersheim 1976	System acceptance	Multiple item likert type scale	
Kaiser & Srinivasan	User attitudes	Multiple item likert type scale	
Lucas 1975, 1976	User attitudes	Single item, likert type scale	
Maish 1979	User behavior	Multiple item, behavioral anchored scale	
Maish 1979	User attitudes	Multiple item likert type scale	
Robey & Farrow 1979	Conflict	Single item, likert type scale	
Thurston 1959	New work patterns	Interview	

Table 3: Measurement of user satisfaction

"There is too little involvement in developing a system and too little ownership of the resulting system. These conditions lead to lack of use and dissatisfaction with the system" (Lucas, 1978 p.43).

"In relation to other factors, eg. top level management support, competence of EDP staff, quality of goal setting, user involvement seems to be the only one which is consistently related to the quality of the final outcomes" (DeBrabander and Edstrom, 1977, p.191).

"The management information systems literature shows almost general agreement that the success of information systems can be improved by involving the user in the development of those systems" (Franz and Robey, 1986 p.329).

"Participation by these who will be affected by the system is essential. This is especially true for operating managers" (Dickson and Simmons, 1970).

In the third phase of the MIS literature studies, reviews of the previous studies have been made. Most of these reviews emphasized the need for high quality, theory based, and carefully executed empirical studies (Ives and Olson 1984, Melone 1990, Premkumar 1992).

This tendency has been followed by the generation of somewhat standardized or well-accepted measurement scales (Bailey and Pearson, 1983). Bailey and Pearson's user satisfaction scale is referred in Hawk and Aldag, 1990 as one of the most popular instruments to measure user satisfaction and that encouraged more widespread incorporation of research construct. On top of the critics of previous literature, new proposals have been

added.

Redefinition of involvement concept, measurement biases in user satisfaction and involvement in the studies were determined (Barki and Hartwick 1989, Hawk and Aldag 1990). As a result, more sound and valid studies were initiated to rehabilitate the deficiencies of previous work.

DeBrabander and Tiers have tested their explanatory model by controlled experiments to observe the situational factors that affect effective communication between MIS users and EDP specialists (DeBrabanber and Tiers, 1984). The results of their study claimed that one may expect that intra-team communication will be more effective when the members of a team have also received some preparatory explanation about the operational and systemic contingencies affecting the system to be developed as well as the basic operational and systemic properties involved in the system (De Brabander and Tiers, 1984).

In addition to the communication gap, top managers tendency toward MIS in general has been realized as another factor effecting MIS success. Historically, user involvement in information systems was considered as participation in the system development process by potential users or their representatives (Barki and Hartwick, 1989). Then by the end of 1980's, it has been defined and measured as a set of operations or activities that users have (or haven't) performed. Actually, user involvement recently redefined by Barki and Hartwick refers to the state that reflects the importance and personal relevance of a system to the user.

In that respect a user highly anticipated in a system development process may not be highly involved with it if she does not give enough importance to the system. On the other hand, a user who does not participate in the system development process can well be involved in the system if the person thinks that the system is relevant. William J. Doll examined this question : "What if this person is the Top Manager ? "Doll examined the top manager's role in providing guidance for information systems development activities (Doll, 1985). He claimed that management, rather than the hardware, software, or technical expertise, is becoming viewed as the missing ingredient in the recipe for successful MIS development efforts.

Although most developers would agree to user involvement in principle, it requires a greater commitment to make it work. Engineers and other team members may not follow through for several reasons. They may lack empathy or sympathy for inexperienced or non-technical computer users. When developers and users meet, they may find that different values, work styles, even languages get in the way of communicating. Developers tend to be young, rationalistic and idealistic, products of relatively homogeneous academic environments. They often have little experience or understanding of the very different work situations and attitudes of many system users. The best intentions can succumb into these factors, especially in the face of the slowness and imprecision that often accompanies user involvement (Grudin, 1991).

Actually the design of a computer based MIS should be a cooperative effort between system developers and users. To conform with users' information-processing needs, they must be able to influence the process, if the purpose of a development effort is to better

support the user's decision making task.

Similarly, system developers must have influence on the process in determining the technological constraints and possibilities. Finally, the process must end in an agreement whereby different considerations are matched and taken account of (Edstrom, 1977).

In the last decade, it is a fact that empirical researches have dominated the scientific work in the MIS field. Methodologies for conducting the case study of information systems have been presented by Lee (1989).

In order to get detailed information about the evolution of empirical research in IS, the reader may refer to Cheon, Graver and Sabherwal (1993). Their study concludes that the recent emphasis on methodological rigor on organizational level issues are signs that indicate the maturing of the MIS field.

The methodology followed in this particular empirical study about the organizational issues of MIS is presented in the following chapter.

4 METHODOLOGY

Although there are a large number of research methodologies that are applicable to MIS research, given the diversity of the MIS field, it is nonsense to assert one best approach to conducting MIS research (Jenkins 1985). Yet, the selection of the best methodology can be determined within the context of the research objective.

The research methodology followed in this study can be named as *group feedback analysis* as presented by Jenkins (1985). Employing this methodology, groups of human subjects complete an objective instrument for testing of the researcher's initial hypothesis. Following the statistical analysis of the collected data, the data and the analysis are discussed with the subject group to obtain their subjective evaluation.

In this study, in order to collect objective data (to test the relationship between MIS user satisfaction and involvement) questionnaires have been conducted. However, the interviews were performed not only after, but also before the tests. The intent is to achieve a deeper analysis than that afforded by the statistical analysis alone.

As the first step, the following were identified ;

- the MIS environment to be studied,
- possible different MIS user groups in the environment,
- measures of MIS users' satisfaction and involvement.

4.1 MIS Under Study

The evolving base of today's world is that information about money is as important as money itself. The way how you present information to the management is likely to be the heart of the financial sector. Hence, İŞBANK's MIS environment was selected as the basis for this study.

What was important ten years ago has been achieved in İŞBANK today. That is to say that all current financial transactions can be performed by computers without errors and minimal delays. Having completed the automation of its services totally in all of its branches, İŞBANK aims to be in the process of implementing better ways for the current system.

İŞBANK's software applications are developed in house by İŞBANK's Information Processing Center (IIPC). In IIPC, there is an MIS group. Although MIS is a recently spoken subject (only the last 2 years, especially by upper level managers and managers of big branches) in İŞBANK, the MIS group is rich in both human and other resources, representing the importance given to the studies in the MIS field.

4.2 MIS User Groups

One of the questions to be responded by this study is the existence of differences in satisfaction and involvement levels of different MIS user groups. For that reason, after selecting İŞBANK's MIS as our MIS environment, identification of possible different user groups was performed.

In order to do that, several interviews have been conducted in IIPC, branches, and the organizational department of general management of the bank. The initial interviews were mainly used to set and define criteria that classify MIS users.

According to the classification made by IIPC, there are four different main user groups in the bank's computer based information system. These groups differ mostly in their reasons to use the system, type of information they use and ways to reach the information. However, members of the same group carry almost similar characteristics. Requirements of those groups are fulfilled by different groups of IIPC. The different MIS user groups defined by IIPC and the assigned groups that serve for these types of users is presented below ;

- Management.....MIS group,
- Branch users.....Branch application group,
- ATM users.....ATM group,
- İŞBANK's information processing center (IIPC) employees.

Each user group has access to different screen types. Information retrieved by these screens are also different. Managers can use MFS screens, while other users has access to personal computer and Nixdorf screens[3].

In the perspective of this study, ATM users are not given any further consideration in order to concentrate on the internal users of the system.

[3]PC and Nixdorf screens are mainly used for transactions

Having mentioned about the different types of user groups in the perspective of this study, following paragraphs present some common characteristics of them briefly.

Management Group: This group includes not only top level managers, but also managers of branches. Top level managers consist of general manager and the board of directors. They have access to MFS screens, which are closed to branch use. Managers don't have to use the system, and their power may be more effective than that of branch people. Hence, shape of involvement and satisfaction patterns are expected to be found different than that of branch people's.

Interviews conducted in the branches with branch managers and those in organization department of the general management led us to include second managers, assistant managers and sometimes even department chiefs at branches in the management group. This was caused by the fact that these people are the ones who actually use MIS and present the information to the branch managers, while the branch managers usually stay away from the system.

Although the questionnaires conducted both with the branch managers and with the managers who work at general management are the same, their responses will be kept in different records for comparison purposes among those groups.

Branch User Group : This group, excluding the branch manager, considers all branch employees who use computer based information system in their daily jobs. For this group, it is mandatory to use this system for transactions. These people have limited access to Nixdorf and PC screens. This group consists of mainly front-line users, who

touch money as they work with the system .

IIPC Staff Group : This group is included in our list in order to compare MIS users' satisfaction and involvement patterns with IIPC staff's perceptions. Application Test Center (ATC) is a subgroup in the IIPC. IIPC group, except for the ATC staff, is on the production side of the MIS, not on the consumption side. With this in mind, one should not consider them as regular MIS users. However, in order to compare the link of user involvement to user satisfaction when involvement is assessed by the system analysts to when it is assessed by the users, several people in this group have been interviewed.

IIPC staff were asked to answer questions as if they are branch people or managers. People in the MIS group of the IIPC were given the questionnaires prepared for the management group. Likewise, people in Branch Application Development group in IIPC were given questionnaires prepared for the branch users. For detailed information about the conducted questionnaires readers may refer to the following subsection called *Measures of MIS User Satisfaction and Involvement.*

Backgrounds of the people in MIS group consist of business administration and management as well as computer science, while most of the people in the Branch Application Development group[4] are from computer engineering. In addition to them, people in Application Test Center of IIPC were given the questionnaires.

Application Test Center (ATC) : ATC was formed in 1988 in order to get feedback from users working at the branches about the computer applications developed for branch

[4]a group of IIPC that develops applications for branch usage

usage. ATC looks like an ordinary branch of the bank. It has a manager, second manager, chief and other people coming from an ordinary (mostly big branches though) branches of the bank.

Initially, ATC people were selected by managers according to their good performance, familiarity with computer usage and good relations with other managers. Although ATC consists of people coming from branches, it is not an actual branch. All of the transactions here are performed in a test environment. ATC does not have real clients in the office and the physical office conditions are better than that of other branches.

ATC consists of only 8 people and out of them only 4 were given the questionnaires. As the size of the sample is very small this groups data were used as part of IIPC staff data.

4.3 Measurement of MIS User Satisfaction and Involvement

Identification of the measures of MIS user satisfaction and involvement is one of the most important parts of this study. As stated in the *Literature Review* chapter, considerable research has been conducted to demonstrate users' involvements effect on user satisfaction from MIS and system success (Hawk and Aldag 1990, Ives and Olson 1984, 1981).

We used the scale developed and partially validated by Bailey and Pearson (1983) to measure MIS users' satisfaction level. This instrument has been referred to in later MIS

studies as one of the most popular scales for measuring MIS user satisfaction (Swanson 1982[5], Baurodi, Olson and Ives 1986, Hiltz and Johnson 1990, Melone 1990).

The test consists of 39 factors[6] that are found to be effective in MIS user satisfaction. The measure is based on the semantic differential of four adjective pairs which describe each factor. The relative importance of the factor is based on a separate fifth reaction.

$$S_i = \sum_{j=1}^{n} R_{ij} W_{ij}$$

The definition of satisfaction is the sum of the user's weighted reactions to a set of factors, where ;

S_i : satisfaction of individual i,

R_{ij}: reaction to factor j by individual i,

W_{ij}: importance of factor j to individual i.

The scaling of the seven intervals was quantified by assigning the values -3, -2, -1, 0, 1, 2 and 3 to the intervals. The importance scale was assigned values from 0.10 to 1.00 with steps of 0.15, the value 0.10 being associated with extremely unimportant and 1.00 with extremely important. Using these numbers, the reaction of an individual to a given factor is the average of the assigned values ;

[5]while the instrument was still in development process

[6]Test for branch people includes 36 factors. Hence, in the following formulas 36 must replace 39 for those tests.

$$R_{ij} = \frac{1}{n} \sum_{k=1}^{n} N_{i,j,k}$$

n = the number of responded adjective pairs of a specific factor,

$N_{i,j,k}$ = the numeric response of user i to adjective pair k of factor j.

Thus, R_{ij} can take on values from -3 to +3. Summing the individual weighted factor responses, one gets the overall satisfaction for the user ;

$$S_i = \sum_{j=1}^{39} \frac{W_{ij}}{n} \sum_{k=1}^{n} N_{i,j,k}$$

The range of S_i is from +117 to -117. The perceived satisfaction as measured by the above equation can be deceiving. The problem occurs because a given individual may have no reaction to one or more factors. For example, a user evaluated 20 of the 39 factors as highly satisfactory (eg. +3) with an extreme importance (eg. 1.00) and evaluated other 19 factors as neutrally satisfactory (eg. 0) and unimportant. Then the perceived overall satisfaction score would be 60, approximately half-way between 0 and 117. This user can only be viewed as highly satisfied, yet her score suggests only a moderate rating.

To overcome this problem, the score can be normalized to ± 1. The normalized score is based only on factors with at least one nonzero response in the first four adjective pairs. Factors evaluated with only zero responses are omitted as not meaningful. The normalized score for a user is equal to the actual divided by the maximum possible. The

maximum possible score is given as the number of factors receiving at least one nonzero score multiplied by 3.0. That is ;

$$NS_i = \frac{S_i}{(F_i \times 3.0)} \text{ where}$$

NS_i = normalized satisfaction for user i,

F_i = number of meaningful factors

$$F_i = \sum_{j=i}^{39} \delta_{ij}$$

where, $\delta_{ij} = 1$ if $\sum_{h=1}^{4} N_{ijk} > 0.0$, zero otherwise.

Thus, the normalized score ranges from -1.00 to +1.00. -1.00 represents maximally dissatisfied, while +1.00 represents maximally satisfied. Table 4 represents the score boundaries for normalized user satisfaction, NS_i as stated by Bailey and Pearson (1983).

As the original questionnaire is in English, we translated it into Turkish. To make it more understandable by the target readers, the Turkish copy was prepared by the help of İŞBANK's manager of Organization Department.

Out of 39, some of the factors were eliminated from the questionnaires so that it would be more meaningful for the branch group people. Factors 4, 12 and 37 in the questionnaire were not asked to the non-manager group. The questionnaire is given in appendix A.

Normalized Score	Translation
1.00	Maximally satisfied
0.67	quite satisfied
0.33	slightly satisfied
0.0	neither satisfied nor dissatisfied
-0.33	slightly dissatisfied
-0.67	quite dissatisfied
-1.00	maximally dissatisfied

Table 4: Score boundaries for normalized user satisfaction

As for the instrument to be used for measuring MIS user involvement level, part of the scale suggested by Franz and Robey (1986) has been selected. From the scale, questions aiming to measure user involvement in both design and implementation stages were included in our test.

With the original instrument, only information about the current situation of user involvement can be gathered. To get further information about the perceived level of optimum user involvement, two more scales were added for each question. These questions ask the target that, according to them, what should be the involvement levels of users, and when asked to them individually how much they would like to involve in the process.

The difference in the responses to the first two scales, namely the scales for current and optimum levels of involvement, were calculated for each question. Then adding the absolute value of them, the number showing the total difference of the perceived optimum involvement level, Δ_i is found for each person. That is,

$$\Delta_i = \sum_{j=1}^{13} |f_{ij} - s_{ij}|$$

f_{ij} = response of individual i to the first scale in question j

s_{ij} = response of individual i to the second scale in question j

The current involvement level I_i were calculated as the sum of the individual responses for the first scales in the second part of the questionnaires. Again in this scale, the assigned values range from -3 to +3, by increments by 1.That is ;

$$I_i = \sum_{k=1}^{13} f_{ik}$$

where, f_{ik} is the response of individual i to question k on the first scale of the questions [7].

In this study, normalized satisfaction score NS was regressed with current involvement level, I, and with deviation from the expected level of involvement, Δ.

4.4 Conducting the Questionnaire

The questionnaire used by this study is composed of two main parts. In the first part users satisfaction levels, in the second part users involvement levels were aimed to be

[7] in this part 13 questions of this type were asked.

measured. [8]. At the end of the second part of the questionnaire questions which are specific for İŞBANK were appended. These questions aim to test the awareness of the target people from the mechanisms giving intensive for the user involvement in the bank.

Unfortunately, our initial trials for conducting the questionnaire free from the organizational context have failed as some branch managers didn't respond to the questionnaire. Later, contact with Organization Department of the Bank was provided. As a result of this contact, list of sample branches and names of bank managers was generated. Those people were informed by the Organization Department before the questionnaire were conducted. The questionnaires stayed with the respondents for at least one week.

To eliminate, or at least to decrease the possible negative effects of this, the target people were informed, before the questionnaires were conducted, that the individual results will not be given to the bank management.

Having explained the methodology of this study, the next chapter presents the findings of the study. In the next chapter, both statistical results obtained by the questionnaires and feedbacks provided by the pre and post interviews will be presented.

[8]See appendix A for the questions and its format

		Manager	Non manager	Total
General Management		Several Departments **total : 11**	-	**11**
Branches	Branch A	6	6	**44**
	Branch B	5	3	
	Branch C	4	4	
	Branch D	3	4	
	Branch E	2	3	
	Branch X	1	3	
		total : 21 + 1*	**total : 23 + 5 ***	
IIPC	EDP	8	7	**19**
	ATC	3	1	
		total : 11	**total : 8**	

* invalid or incomplete questionnaires

Table 5: Distribution and number of questionnaires conducted

5 FINDINGS

In this chapter, the results of conducted questionnaires as well as pre and post interviews will be presented, classified and evaluated to respond to the questions asked in the *Problem Definition* chapter.

The number of people given the questionnaires and their groups are given in Table 5. In total, 80 people were given the questionnaires, though 6 of these turned out to be incomplete and not suitable to be evaluated. Hence, they are not included in the calculations. As shown in Table 5, 1 person from branch manager group (either manager, second manager or chief)and 5 non-managers (namely the front-line people) have sent

incomplete questionnaires that are not counted by the study.

5.1 Statistical Findings

After calculating the numbers for satisfaction level NS, current involvement level I and deviation from the optimum involvement level Δ, regressions among those variables were performed. The normalized satisfaction level was considered as the dependent variable, while the divergence from the optimum involvement level and current involvement level were counted as independent variables.

The scatter diagrams for the data of each user group and overall sample are available in Appendix B.

Table 6: Overall Regressions for NS with Δ

User Group	n	R	p	line equation
IIPC	19	0.65	0.002499	-0.02x + 0.72
Non managers	23	0.63	0.001109	-0.02x + 0.86
General Mng.	11	0.57	0.062694	-0.01x + 0.67
All	74	0.45	6.62E-05	0.66x
Branch Mng.	21	0.13	0.556088	0.002x + 0.45

Table 7: Overall Regressions for NS with I

User Group	n	R	p.	line equation
IIPC	19	0.32	0.181756	0.007x + 0.50
Non managers	23	0.37	0.0845	0.02x + 0.90
General Mng.	11	0.08	0.808004	-0.001x + 0.50
All	74	0.17	0.14875	0.004x + 0.53
Branch Mng.	21	0.02	0.917645	0.009x + 0.50

The summarized information of the regression results are given in Table 6 and Table 7. The detailed information on regressions may be found in Appendix C. The link of user involvement to user satisfaction is found to be stronger when user involvement is assessed by system analysts than when it is self reported. This result is in contradiction to the claims of Hawk and Aldag (1990).

Means of NS_i's and Ii's for each group are presented in Table 8. As the table shows, bank manager group is the most involved and maximally satisfied of all. The EDP staff's judgment for the users' satisfaction level is the lowest. On the other hand, their judgment for the users' involvement level is not the lowest.

Up until now, statistical information obtained by the study have been provided. Actually, statistical significance does not always imply significance. That is rejection of null hypothesis does not mean that precise prediction (practical significance) follows. It does demonstrate to the researcher that within the sample data at least, this particular dependent variable, NS_i, has an association with the independent variables, I_i and Δ_i.

5.2 Non-Statistical Findings

The results of the study give enough evidence to claim that most of the branch people are not aware of some activities promoting user involvement or even the existence of the ATC. Personnel working at branches may not have enough information about their groups involvement patterns. For instance, they don't and can't know who has been involved in the design process. This leads to a conclusion that the flow of information within the

	EDP	Bank Managers	Branch Managers	Non Managers
satisfaction level NS_i	0.39	0.51	0.49	0.45
current perceived involvement level I_i	-17.3	-4.3	-28.6	-20.6

maximum involvement maximum satisfaction

Table 8: Means of NS_i and I_i values

bank is not very efficient in the sense that the employees are not aware of the mechanisms employed by the headquarters. The bank under study has more than 800 branches all over the country. Yet, only 6 of them which are in Ankara were included in the study. This may lead a bias.

Most of the branch people are not even aware of the ATC in IIPC. As a surprising fact almost all of the branch people saying that they are not aware of ATC have answered the following question which asks if they would accept to work at ATC, as yes.

Branch people have greater numbers in their judgments for the divergence of the current involvement from the optimum involvement level. Actually there is no positive current involvement level in their answers.

In addition, out of 81 questionnaires all 6 invalid ones come from branch people. Only

2 of those 6 were interviewed after the tests, and they said as the involvement part was not suitable for them, they did not answer that part.

On the contrary to the branch people, managers of the bank mostly think that the divergence of the current involvement level from the optimum involvement level is low. The obtained level of current involvement is more than that was claimed by the branch people. Out of 11, 5 bank managers, and out of 19, 2 EDP employees answered current involvement level as positive.

The reason of this may be not only that bank managers are more involved, but also that they are more informed than branch people about their involvement patterns. Most of the projects were developed by the information exchange between IIPC and bank managers. Moreover, bank managers have more power in the organization than branch people have. Hence, this may help them to be involved in MIS design and implementation also.

5.2.1 Recommendations

Out of the interviews conducted the following items can be identified as recommendations;

- *Change in organizational structure.* The hierarchic structure of IIPC and the bank should be reorganized. Most of the managers agreed that IIPC may be another organization serving for the bank. Having IIPC as a profit center, the users may increase their power during the system design and implementation phases.

  The recent study for combining the organization department and IIPC under the responsibility of one general manager may be a positive sign in the way to have

better organizational structure. Pros and cons of such implementation will not be presented here, as it requires further investigation.

- *Change in proposal presentation.* The promotion given for the proposals that will provide better services of computer based information systems [9] is an important sign of intensive given in user involvement. A recent project forced branch people to send proposals to the organizational department about MIS. In 6 months, 5182 proposal letters were collected. They were grouped in to 1114 different groups. Among those groups, 128 proposals were determined and 49 of them have been realized.

  During the pre interviews, it has been observed that some branch people and 1 ATC person claimed that the number of proposals will dramatically increase if a pre-designed electronic letter facility format is provided for the branch people.

- *Increase awareness of ATC.* The increased awareness of ATC will provide information for the branch people and hence their knowledge about users' involvement patterns will increase.

Some factors are found to be unrelated or meaningless by some of the respondents. The strongest of all is the claim saying that IIPC people cannot be generalized, yet the questions ask for the general. The level of involvement may change from some IIPC people to the others.

In this chapter, findings of the study have been presented. In the following chapter, summary and conclusion of the findings will be given.

[9] one of the bases of MIS

6 SUMMARY and CONCLUSION

Having presented the output of this study in the previous chapter, this chapter aims to evaluate the output and the scope of the study.

The study aims to observe and interpret the relationships between MIS users' satisfaction and users' involvement. What explains users' satisfaction with MIS ? This question is not an easy to answer type.

"For nearly two decades the user satisfaction construct has occupied a central role in behavioral research in Information Systems (IS). For the most part, the theoretical underpinnings of the construct and its relationship with other constructs (eg. system effectiveness, system success ...) have been assumed. Yet, very little attention has been given to an assessment of these issues. Nevertheless, most academician and practitioners would agree that the IS field has advanced as a result of the research on user satisfaction.

The development of several instruments with which to measure user satisfaction has certainly encouraged more widespread incorporation of the construct in research and its use by practitioners in evaluating system effectiveness. Among the most popular scales are those of Bailey and Pearson (1983), Ives, Olson and Baroudi (1983)" (Melone, 1990).

This study uses the scale developed by Bailey and Pearson (1983) to measure user satisfaction. This scale was partially validated by the researchers who constructed it. Initially , the list of factors that may be effective on users' satisfaction were generated. Then, this list was expanded according to the feedbacks of middle level managers of 8

different organizations. Adding new factors, Bailey and Pearson concluded that the expanded list constitutes a complete domain for measurement. Reliability of the satisfaction questionnaire was calculated for each factor and the reliability coefficients were found to be very high. (Out of 39 factors, 32 of them have resulted in a coefficient greater than 0.90)

Yet, it does not mean that the scale is a perfect measure of users' satisfaction. As Melone stated, the effectiveness of user satisfaction measures can be strengthened to the extent that user satisfaction can be linked with the output oriented (eg. objectively measured user behaviors). She claims that attitudes form, and in some cases they change. The research designs of many user satisfaction studies fail to recognize this fact. Hence, biases exist in the process of measuring users' satisfaction with MIS.

Biases exist not only in measuring users' satisfaction but also in measuring users' involvement levels in MIS design and implementation. How can users' involvement be measured ? This is also hard to answer.

Researchers have provided some evidence that user involvement in information systems development is beneficial. Nevertheless, such evidence may overstate the true relationship between user involvement and system success (Hawk and Aldag, 1990).

Hawk and Aldag claim that the results of studies in which users assess both their involvement and system success are likely to be inflated as results of biases attributable to the methods of variable measurements.The tendency of people to claim credit for success and to avoid blame for failure are likely to result in overstating the relationship

between user involvement and system success.

They claimed that there are two different types of biases present when user involvement and system success are both measured by assessing user perceptions. First, common method variance results in overstating the association between variables, and has been suggested as a problem in many user involvement studies. Second, asking users to rate their own involvement may create a situation in which a self serving bias will result in users overstating their involvement for successful systems and understating their involvement for failures.

Output of this study is not parallel to that of Hawk and Aldag's hypothesis which claims that the correlation between user satisfaction and users' perceptions of user involvement will be greater than the correlation of user satisfaction with systems analysts' perceptions of user involvement.

In this study, measure of user involvement developed by Franz and Robey (1983) has been used with some modifications. The original questionnaire was only in one scale likert type that measures current involvement level in design and implementation processes of MIS development. Two more scales were added to measure expected level of involvement and the individual response when the person is invited for the work.

The difference between the first two scales provided the deviation from the expected level of user involvement. The deviation is assumed as an indicator of users' system satisfaction. We tried to observe if it is true that the larger the deviation the less the satisfaction level of the user. The results of the study present that the deviation from

the expected level of user involvement is a better candidate than the current involvement level to regress with the users satisfaction level.

Almost all of the respondents gave the same answer for the second and the third scale. This may be counted as an indicator for users' willingness to be involved in the process of MIS design and implementation.

Unfortunately, the biases that may exist in this study may be more than that were mentioned before, such as biases in measuring user satisfaction and involvement concepts in MIS. Among the several sources of possible biases the following can be listed ;

- Current measurements for users' satisfaction and involvement does not reflect the organizational culture of the bank. Although the measures were translated to Turkish by the help of the bank's organizational department manager, there remain some factors which are not important for the users. In addition, some of the important factors which may be important for the users may not exist in the measurements.

- Users are not familiar with other MIS, hence they have no chance to compare. The manager of IIPC agreed that MIS is a new concept in the bank. The users are about to get familiar with computerized MIS. Before the current system, they did not work with another one. Furthermore, they mostly are not aware of the utilities of such systems. A possible analogy can be applied with the users of MIS and the people who just learn to drive. MIS users are just learning to drive. But the only car they have ever used is current MIS. They find this better than walking (manual system), though there are certainly better cars in the market.

- Organizational Department of the Bank arranged the appointments with the branch users and the managers of the bank. This may destroy our intension of being free from the organizational context. Yet, without this it was almost impossible to employ this study. To eliminate possible negative effects of this fact on the respondents' answer, they were informed that the individual responses will not be presented to the management.

- EDP personnel were informed that the same questionnaires were given to the real users also. This may generate some pressure on their mind while answering the questions.

- Unawareness of the involvement patterns of the users may put some errors in users' judgments, especially for current involvement level. Most of the branch users' are not aware of the ATC, which is an indicator of user involvement in at least for the MIS implementation process. Hence, many of them replied their current involvement level as the least, almost none. On the other hand, 5 of 11 bank managers and 2 of 19 EDP staff provided positive current involvement levels. This may be due to their awareness of the procedures in designing MIS.

- The fact that the measures are prepared only for the current situation was not explained to all of the respondents. Yet, the measures are for the snapshots of the organization. The respondents' difficulty in answering some questions may come out of that fact. Some respondents said that it is not true to generalize the IIPC people and projects. Because things depend on several aspects, in some projects the IIPC may act as a user oriented group, while in others not.

For further research it is suggested that customized measures be developed with the help of the users in the organization under study. Since MIS can be viewed as an imported concept in Turkey, the relevance of the current measures should be validated before any strong claims are based on these measures.

7 APPENDICES

Appendix A. Questionnaire Used in the Study

Appendix B. Scattered Diagrams of Responses to the Questionnaires

Appendix C. Regressions Data

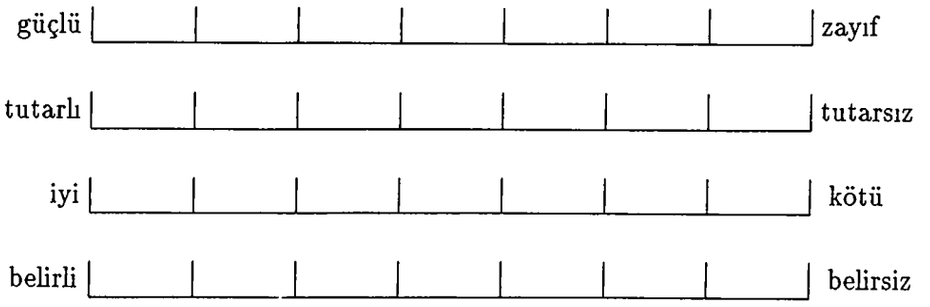
APPENDIX A

Questionnaire Used in the Study

Questions 4, 12 and 37 are not included in non managers' questionnaires

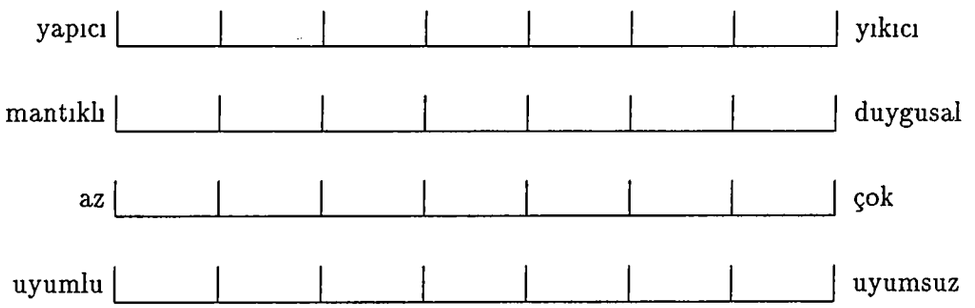
I. Sistemden Ne Kadar Memnunsunuz ?

1. Üst düzey yöneticilerin bilgi işlem sistem, personel veya servislerine karşı olumlu veya olumsuz, ilgi, gayret veya desteklerinin derecesi ;

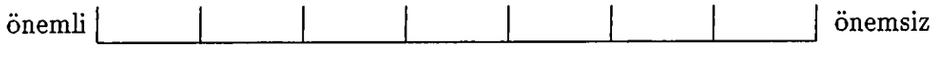


Bu soru bence :

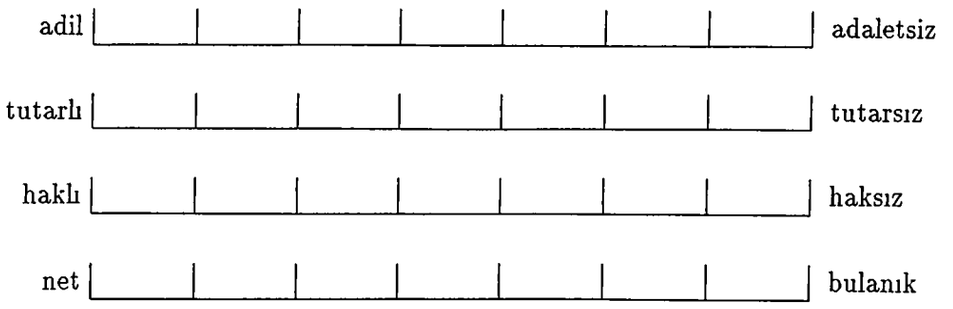
2. Kurumun kaynaklarının kullanımı veya sistemin sorumluluğu konularında bilgi işlem ve diğer birimlerin arasındaki çekişme ;



Bu soru bence :

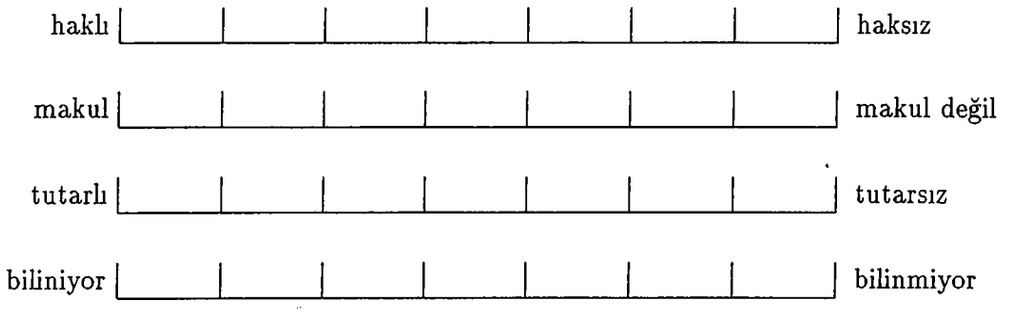


3. Farklı birimler arasında bilgi işlem kaynak ve hizmetlerinin dağılımını, bu dağılımdaki öncelikleri belirleyen kural ve politikalar ;

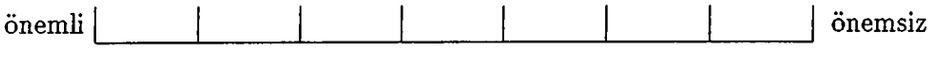


Bu soru bence :

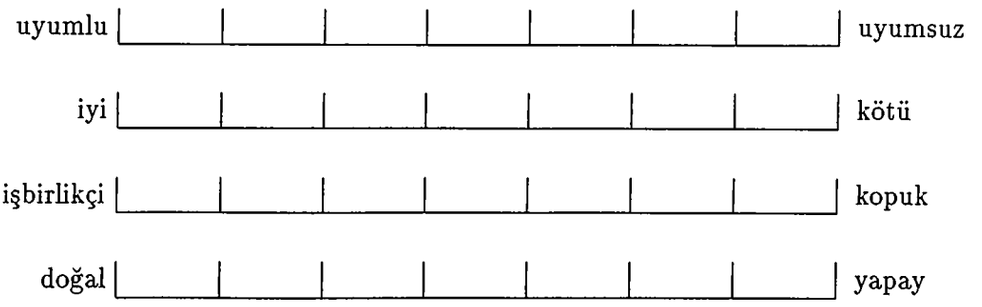
4. Kullanıcıların bilgi işlem kaynak ve hizmetlerinin ücretlendirilmesi ;



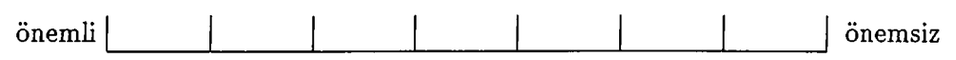
Bu soru bence :



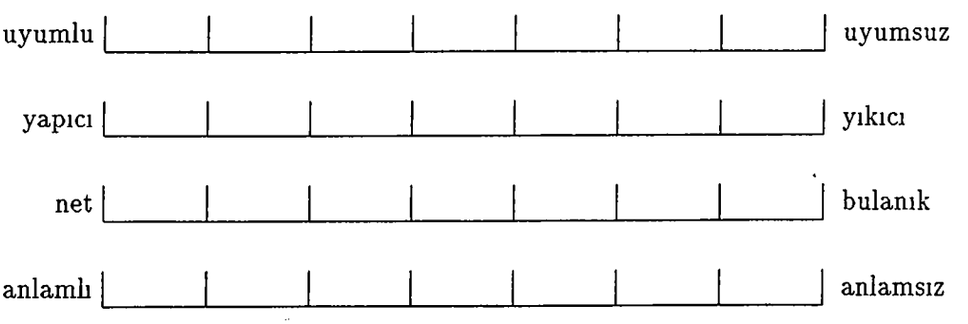
5.Bilgi işlem merkezi çalışanları ile aranızdaki ilişkilerin niteliği ;



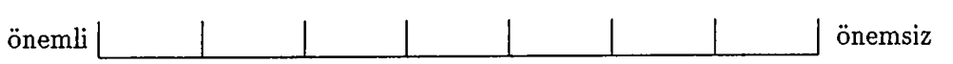
Bu soru bence :



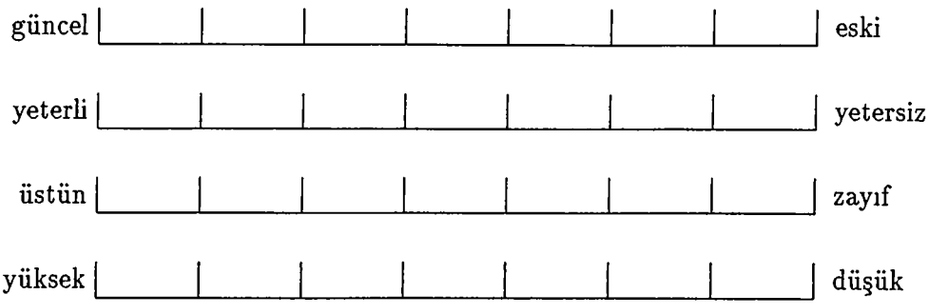
6. Bilgi işlem çalışanları ile aranızdaki bilgi alışverişinin niteliği ve yöntemleri ;



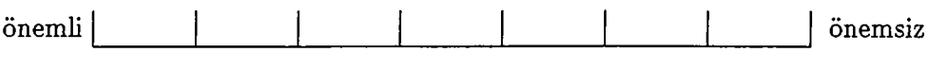
Bu soru bence :



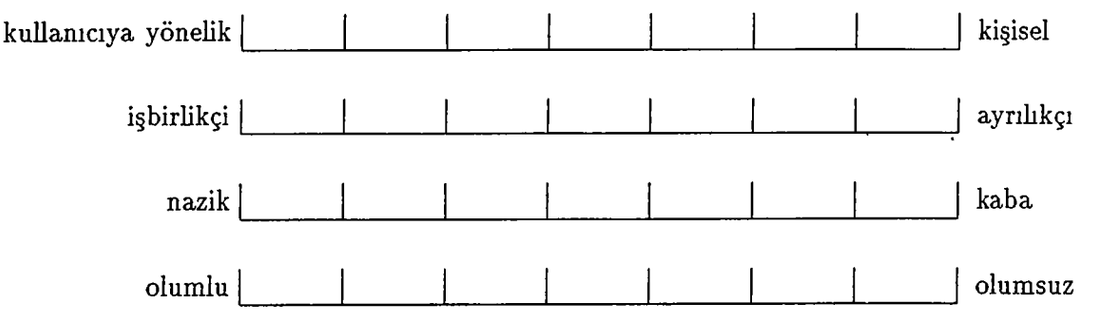
7. Bilgi işlem merkezi çalışanlarının teknolojik yetenekleri ve uzmanlıkları ;



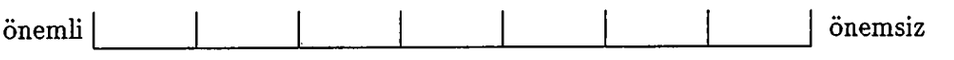
Bu soru bence :



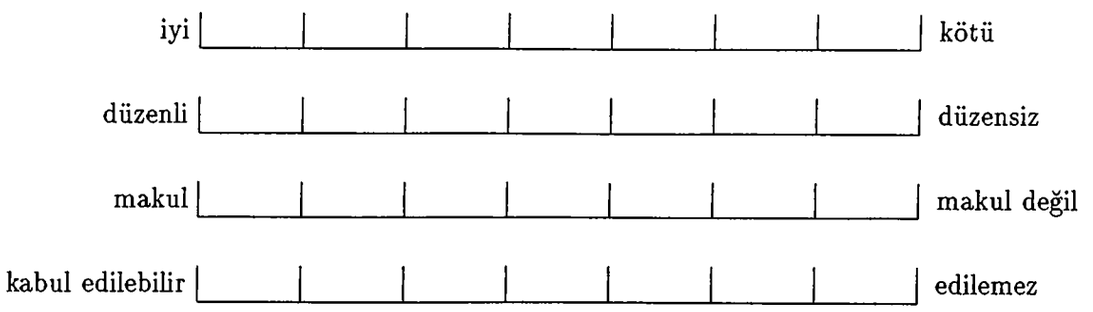
8. Bilgi işlem çalışanlarının kurumun genel amaçlarını benimsemeye yönelik tavrı ;



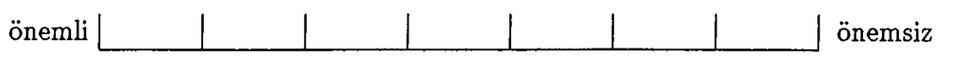
Bu soru bence :



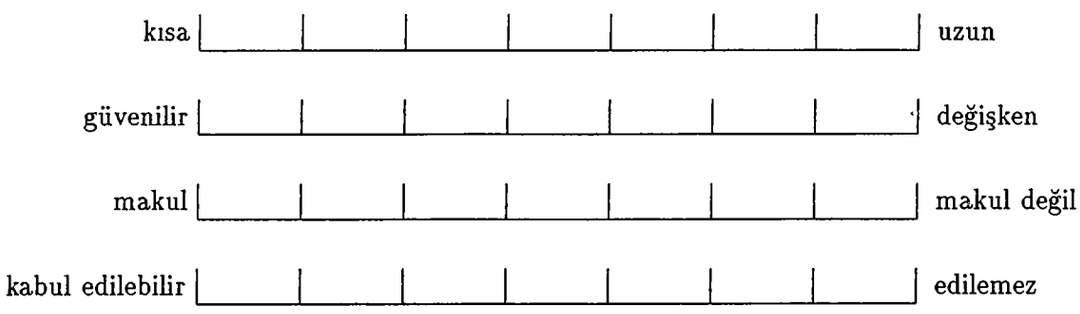
9. Bilgi işlem sisteminin servislerini belirleyen zaman çizelgesi;



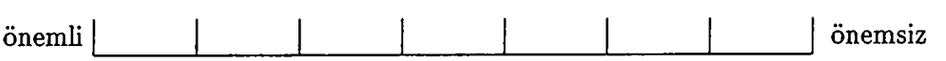
Bu soru bence :



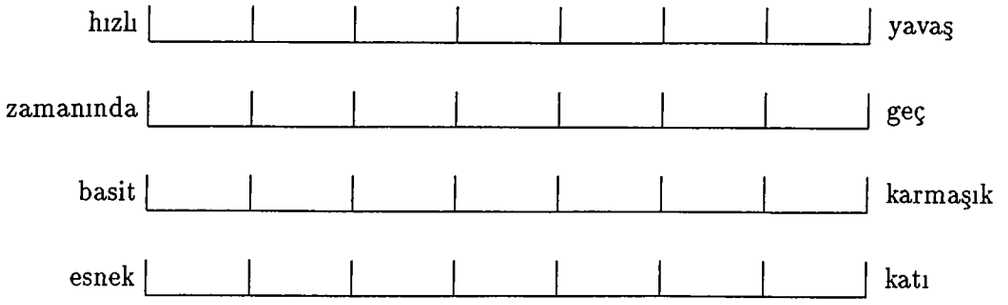
10. İsteğinizin belirlenmesi ile yeni uygulamaların gerçekleştirilmesi arasında geçen zaman ;



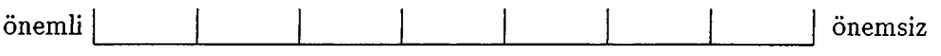
Bu soru bence :



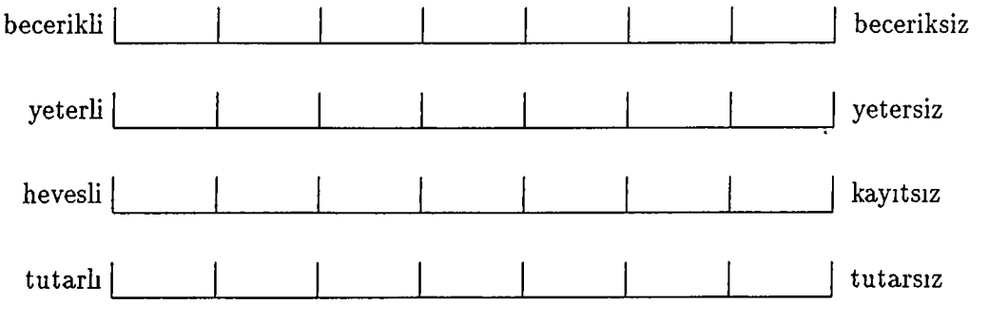
11. Hali hazırda kullanılan sistemle ilgili değişiklik önerilerinizin gerçekleştirilmesinde izlenilen yöntem ve gereken zaman ;



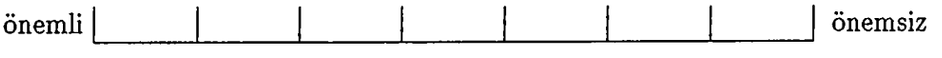
Bu soru bence :



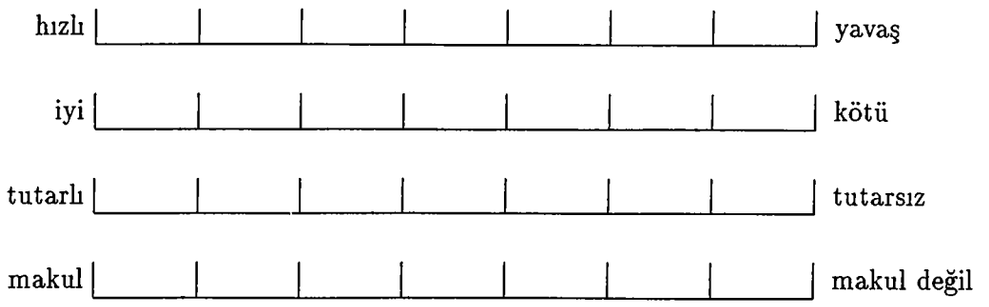
12. Satıcı(lar)'tarafından sisteme uygulanan yazılım veya donanım desteklerinin tipi veya kalitesi;



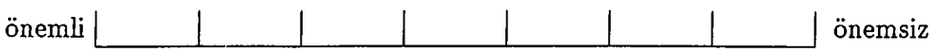
Bu soru bence :



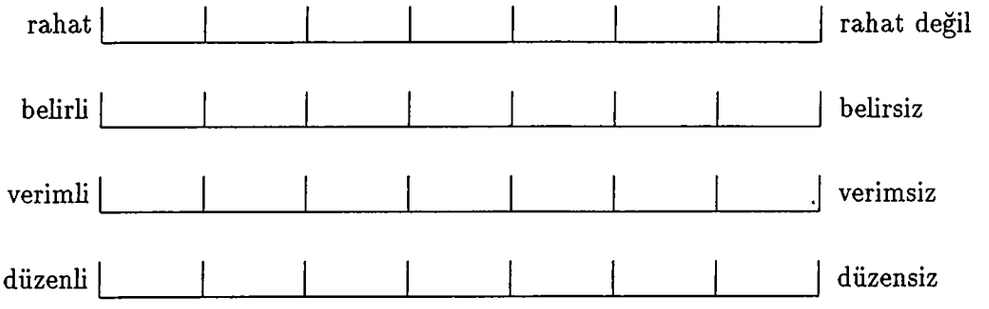
13. Sisteme girişiniz ile bunun gerçekleşmesi arasında geçen zaman ;



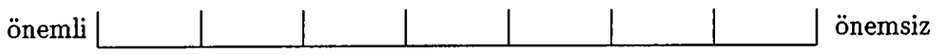
Bu soru bence :



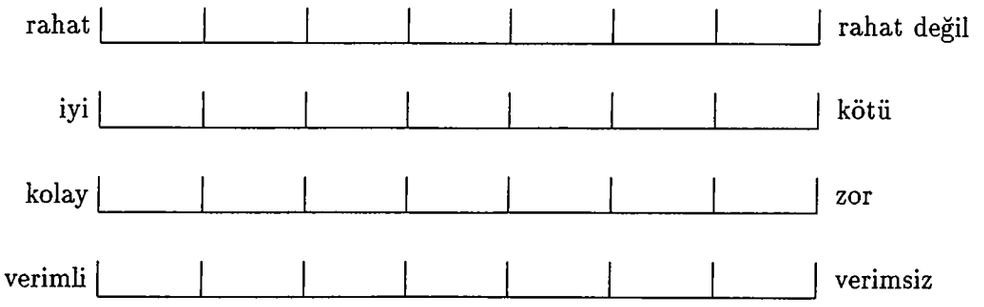
14. Bilgi giriş ve çıktı (bilgi, liste veya döküm) alış yöntem ve araçlarınız ;



Bu soru bence :

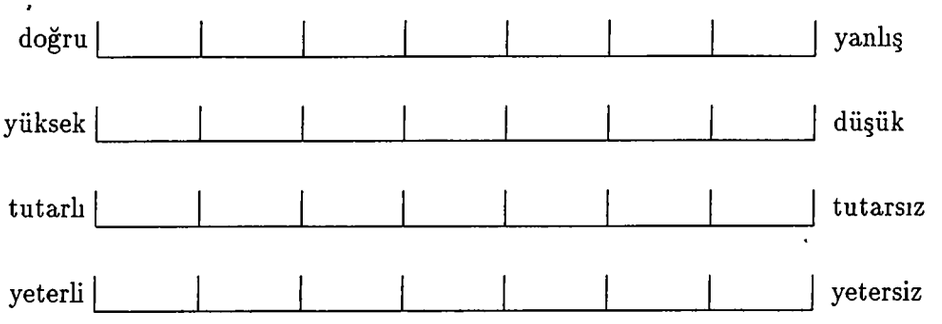


15. Sistem kullanımında karşılaştığınız kolaylık veya zorluklar ;



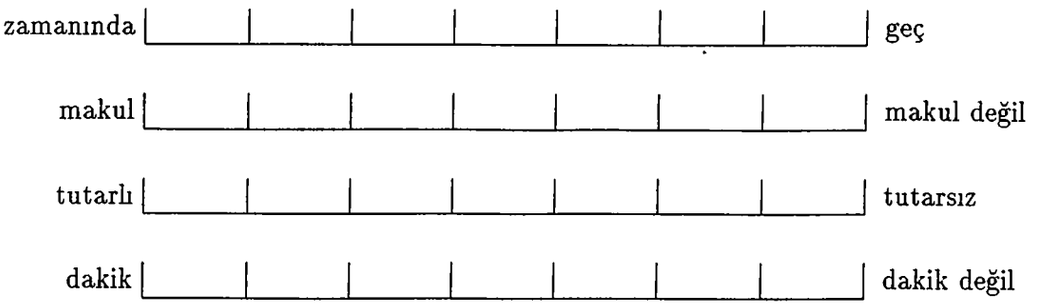
Bu soru bence :

16. Bilgi çıktılarının (bilgi, liste veya dökümlerin) doğruluk derecesi ;

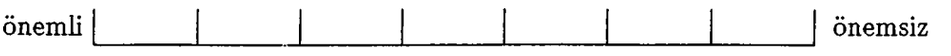


Bu soru bence :

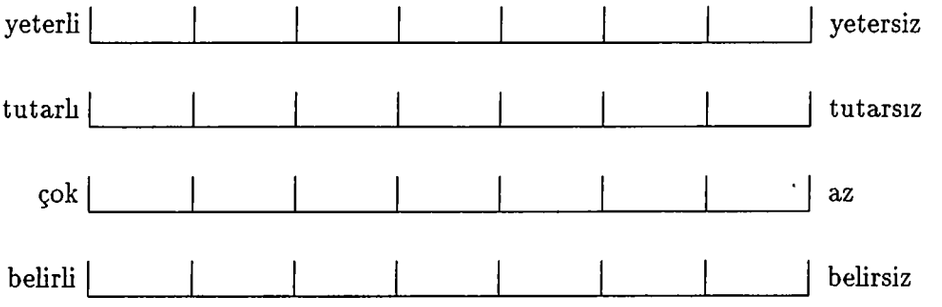
17. Bilgiye gerektiğinde ulaşılabilirlik ;



Bu soru bence :

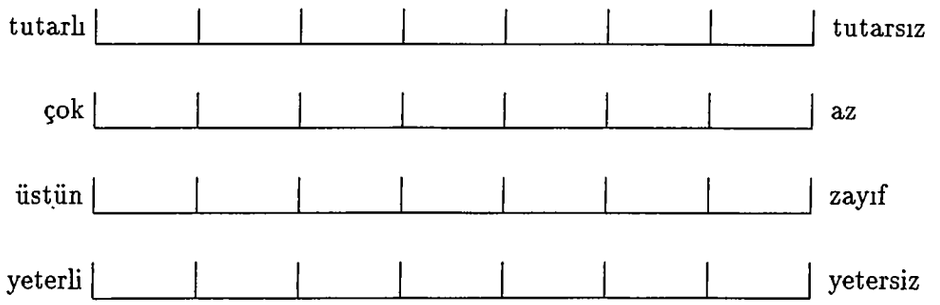


18. Bir işleme yönelik çıktı bilgisinin çeşitliliği ;

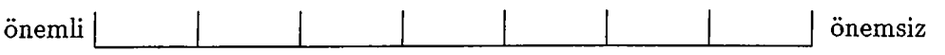


Bu soru bence :

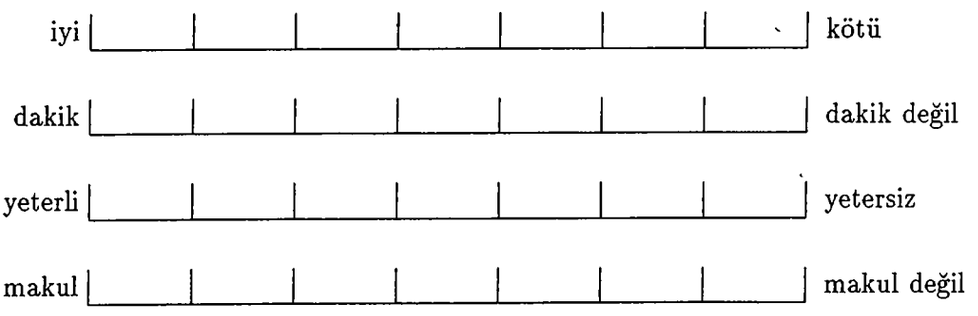
19. Bilgisayar çıktısının tutarlılığı ve güvenilirliği ;



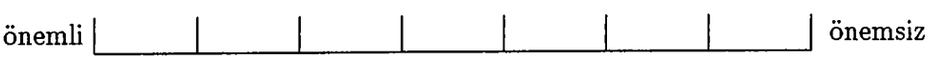
Bu soru bence :



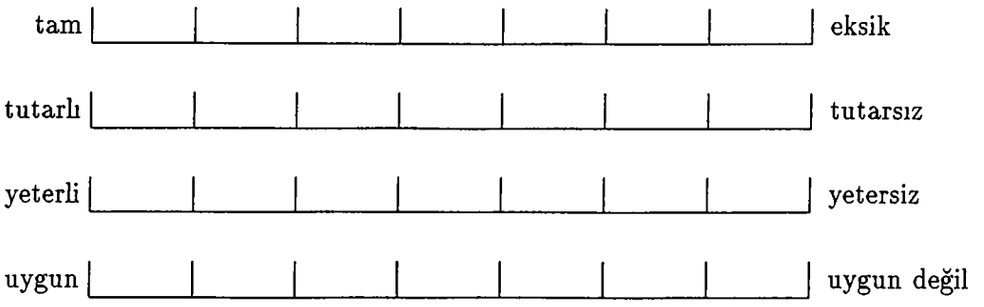
20. Çıktının (bilgi, liste veya dökümlerin) güncelliği;



Bu soru bence :

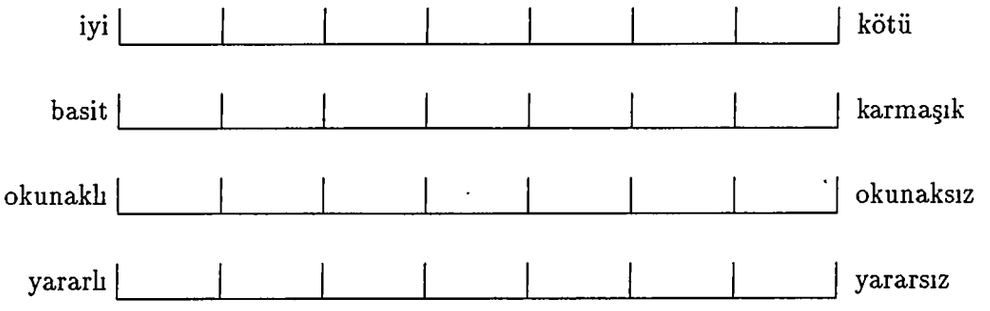


21. Sistem bilgi çıktısının kapsamı ;



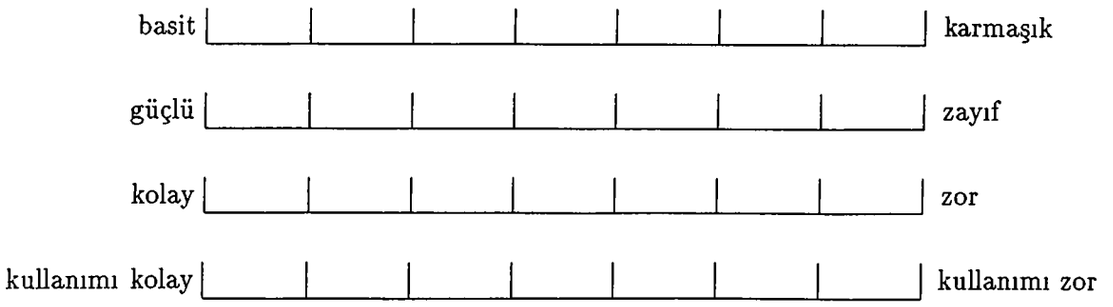
Bu soru bence :

22. Çıktı ve ekranların gösterimi ve sunum düzeni ;

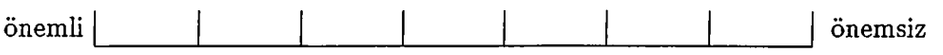


Bu soru bence :

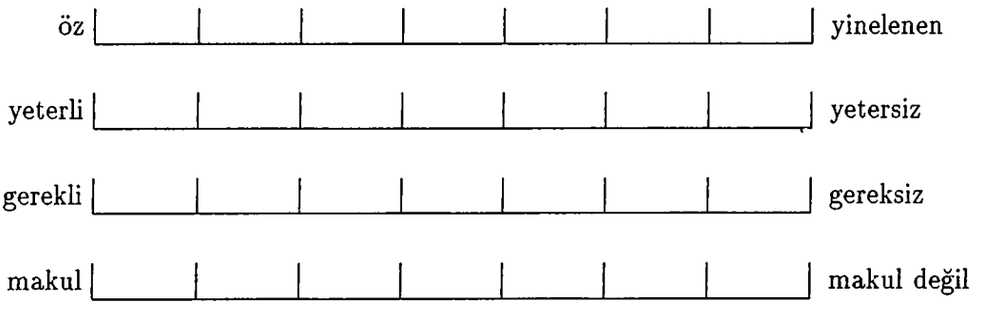
23. Bilgisayar sisteminde kullanılan sözcüklerin seçimi ve sıralanma kuralları ;



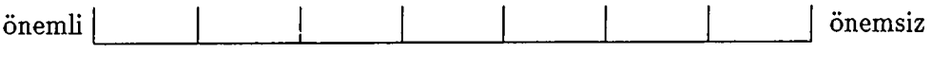
Bu soru bence :



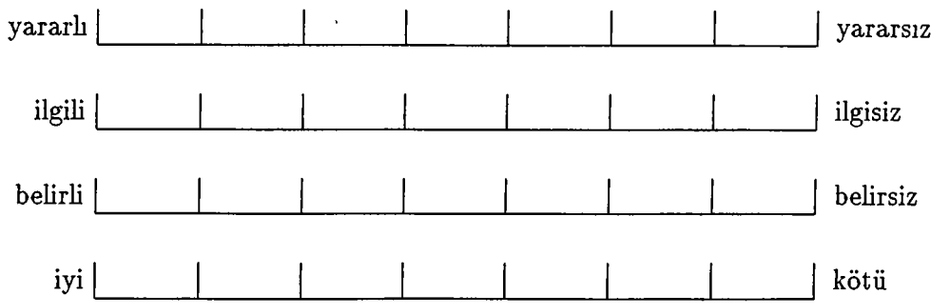
24. Sistemden alınan bilgi miktarı. (Bu miktar sadece rapor ve çıktı sayısıyla belirtilmez, çıktı kapsamı da etkilidir.)



Bu soru bence :

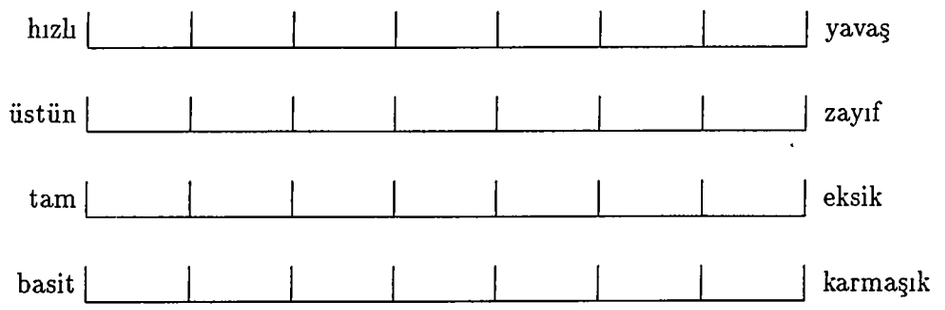


25. Sistemden istedikleriniz ile elde ettikleriniz arasındaki ilişki ;

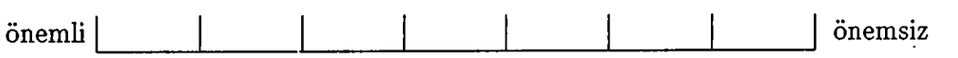


Bu soru bence :

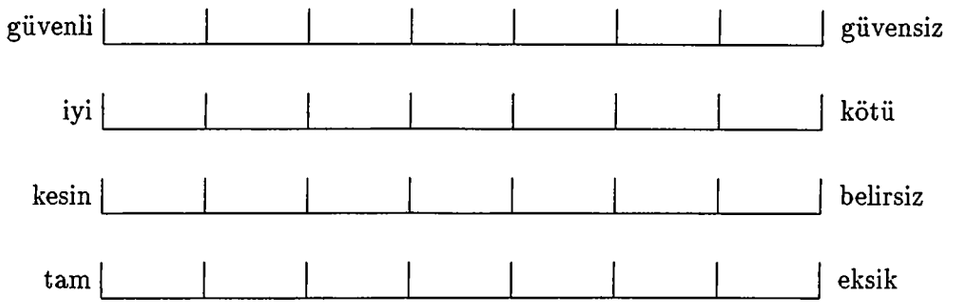
26. Hatalı işlemlerin düzeltilmesi;



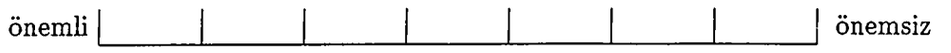
Bu soru bence :



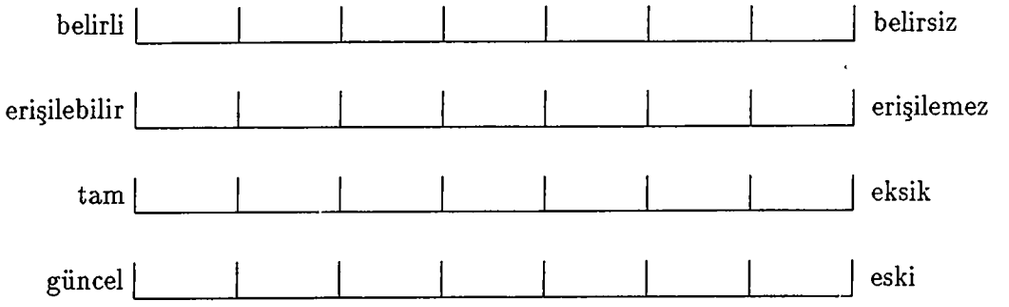
27. Verilerin yanlış uygulama, yetkisiz değiştirilme ve kaybolmaya karşı korunumu ;



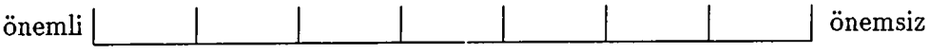
Bu soru bence :



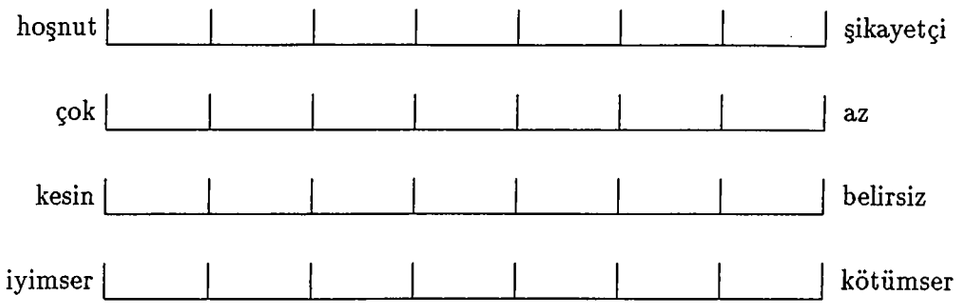
28. Bilgi sisteminin kayıtlı tanımı. (Sistem kullanımını anlatan yönetmelikler, dökümantasyonlar da buna dahildir.)



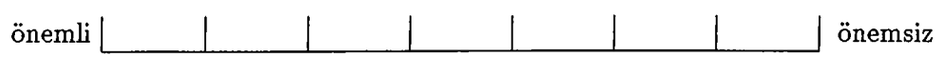
Bu soru bence :



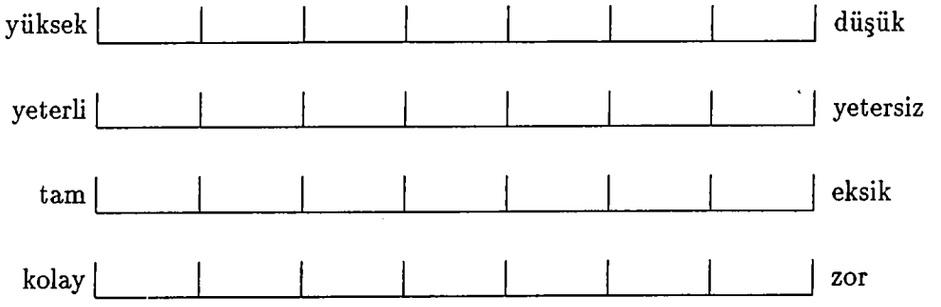
29. Beklentileriniz doğrultusunda sistemin size makul gelen özellikleri;



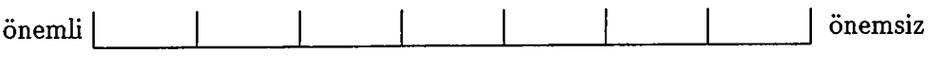
Bu soru bence :



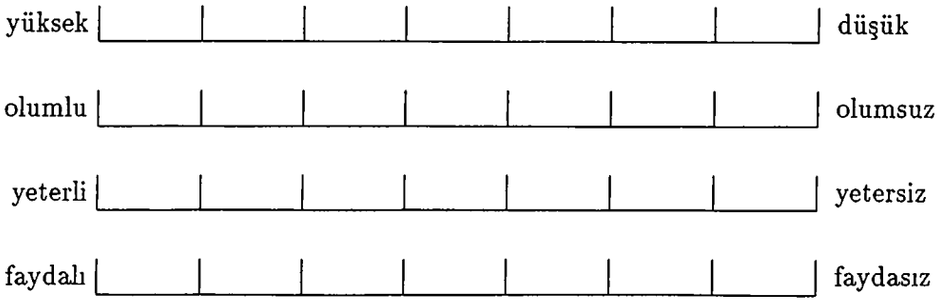
30. Bilgi işlem sistemi ve hizmetleri hakkındaki bilgi dereceniz;



Bu soru bence :

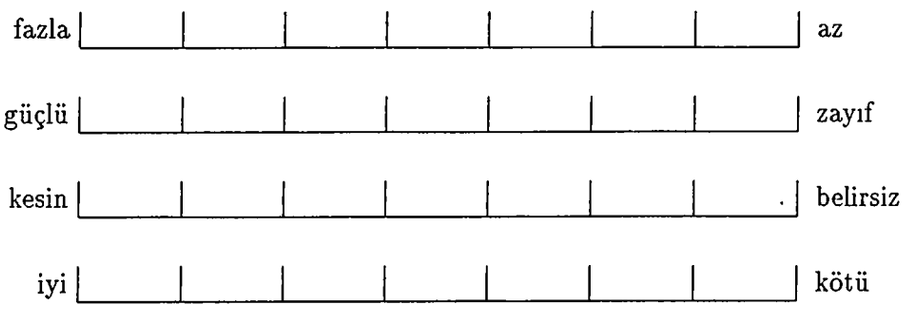


31. Sistemin getirilerinin götürülerine oranı. (Götürüler zaman, para, kaynak, işgücü, getiriler ise sistemden sağlanan her türlü faydayı içerir.)



Bu soru bence :

32. Sisteme güveniniz ;



Bu soru bence :

33. Bilgi işlem sistemine katkı, katılım ve benimseme dereceniz ;

olumlu ____|____|____|____|____|____|____|____ olumsuz

teşvik ediliyor ____|____|____|____|____|____|____|____ teşvik edilmiyor

yeterli ____|____|____|____|____|____|____|____ yetersiz

katılımcı ____|____|____|____|____|____|____|____ katılımdan uzak

Bu soru bence :

önemli ____|____|____|____|____|____|____|____ önemsiz

34. Kendinizi doğrudan ilgilendiren bilgi işlem etkinlikleri üzerinde kontrol düzeyiniz ;

çok ____|____|____|____|____|____|____|____ az

yeterli ____|____|____|____|____|____|____|____ yetersiz

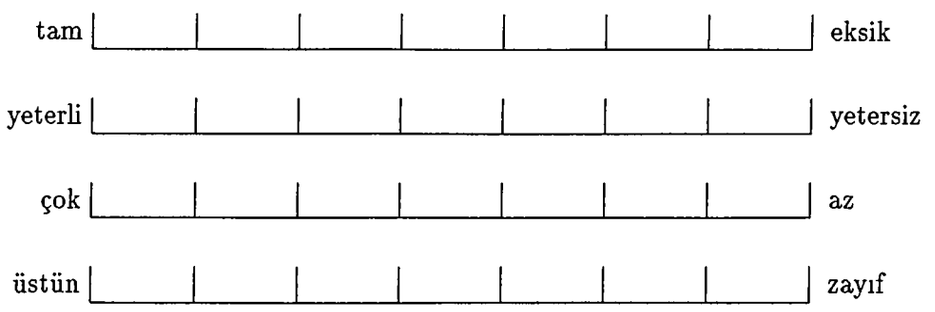
belirli ____|____|____|____|____|____|____|____ belirsiz

güçlü ____|____|____|____|____|____|____|____ zayıf

Bu soru bence :

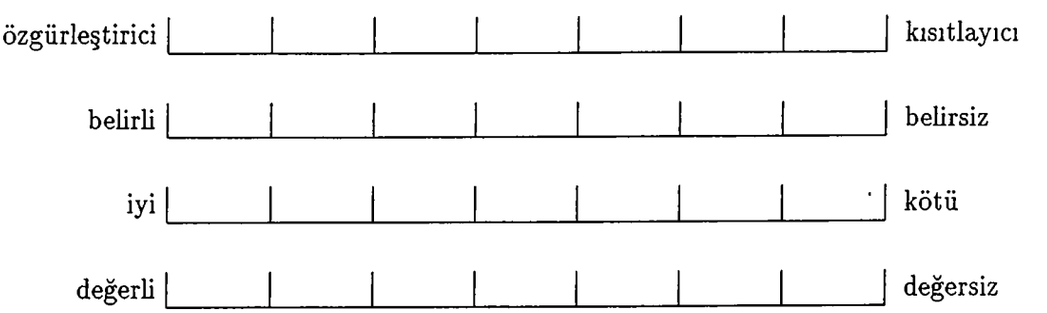
önemli ____|____|____|____|____|____|____|____ önemsiz

35. Sistemin yeterince yanıt veremediği alanlarda özel eğitiminiz ve bunun düzeyi ;

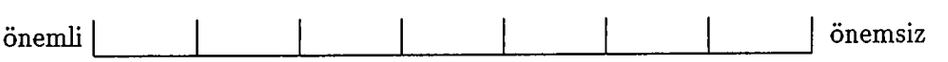


Bu soru bence :

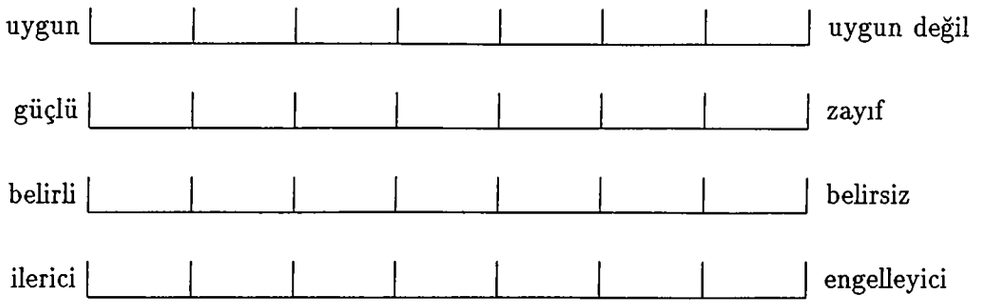
36. Sistemdeki değişikliklerin çalışma serbestisi ve performansınıza yansıması ;



Bu soru bence :

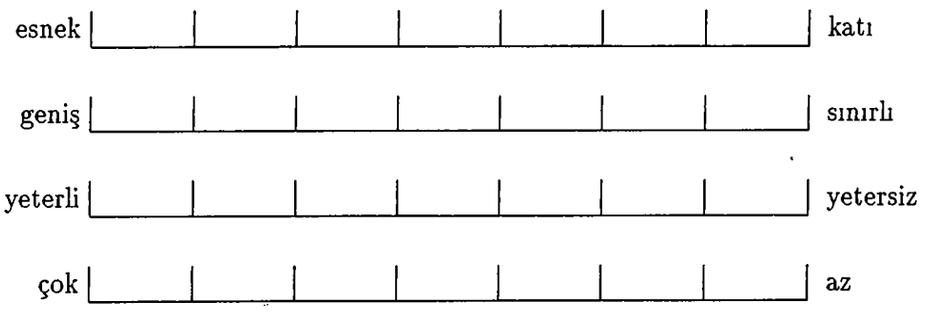


37. Bilgi işlem merkezinin kurumun genel yapısıyla olan hiyerarşik ilişkisi ;



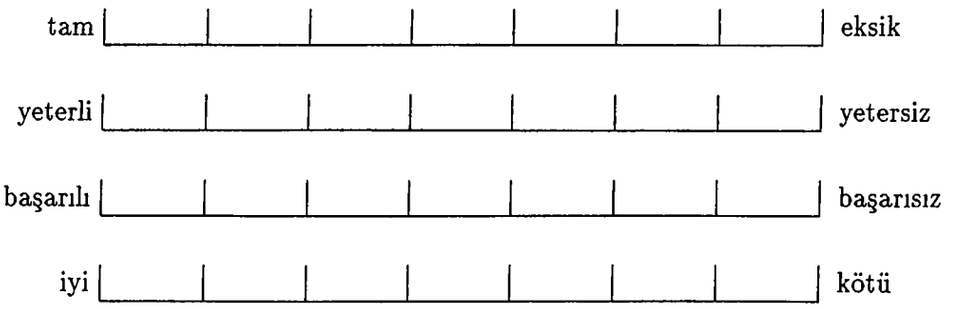
Bu soru bence :

38. Sistemin değişen koşullara uyarlanabilirliği;

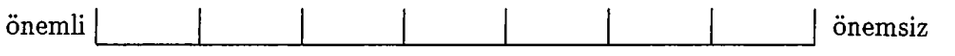


Bu soru bence :

39. Sistemin içindeki farklı birimlerin bilgi iletişim yeteneği;

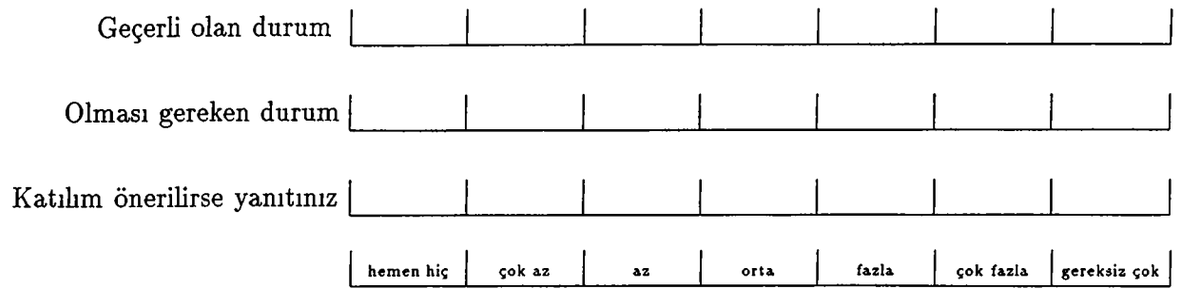


Bu soru bence :

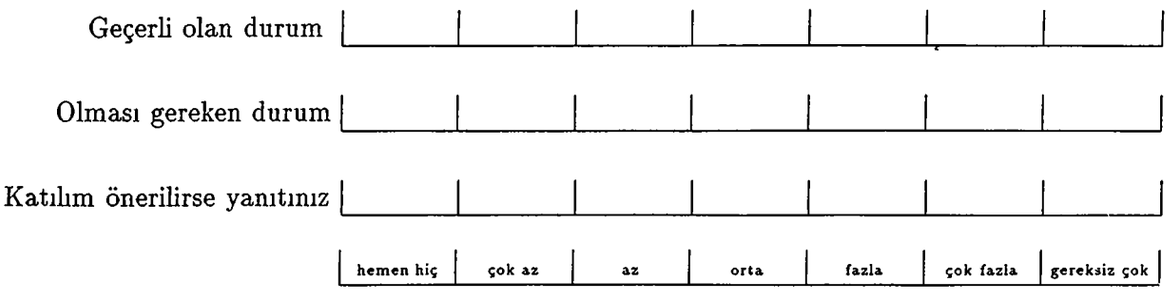


II. Sisteme Ne Kadar Katkıda Bulundunuz ?

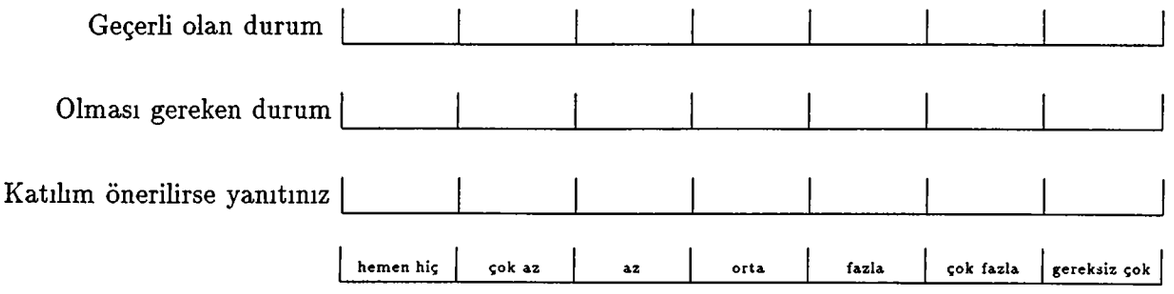
1. Sistemin tasarım aşamasında, bilgi ihtiyaçlarının belirlenmesinde, bilgi işlem çalışanlarından ziyade, siz (ya da kullanıcı grubunuz) ne dereceye kadar etkin rol aldınız ?



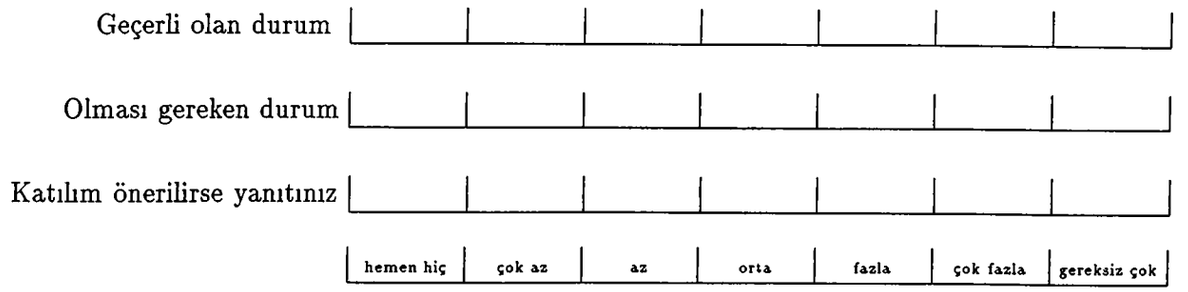
2. Sistemin tasarım aşamasında girdi ihtiyaçlarının belirlenmesinde, bilgi işlem çalışanlarından ziyade, siz (ya da kullanıcı grubunuz) ne dereceye kadar etkin rol aldınız ?



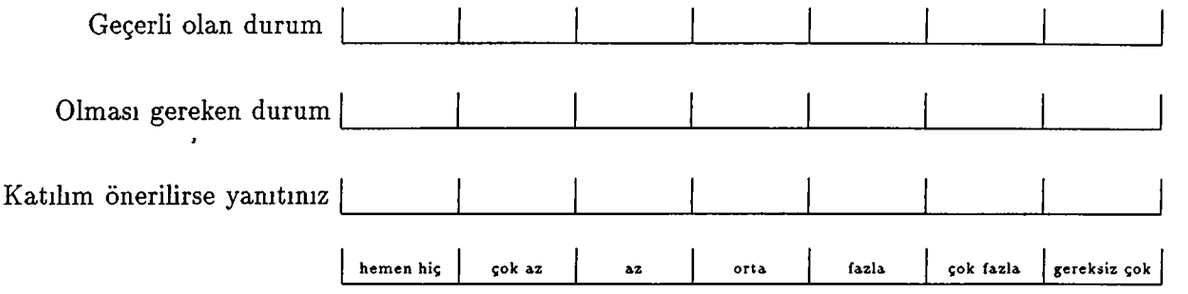
3. Sistemin tasarım aşamasında çıktı ihtiyaçlarının belirlenmesinde, bilgi işlem çalışanlarından ziyade, siz (ya da kullanıcı grubunuz) ne dereceye kadar etkin rol aldınız ?



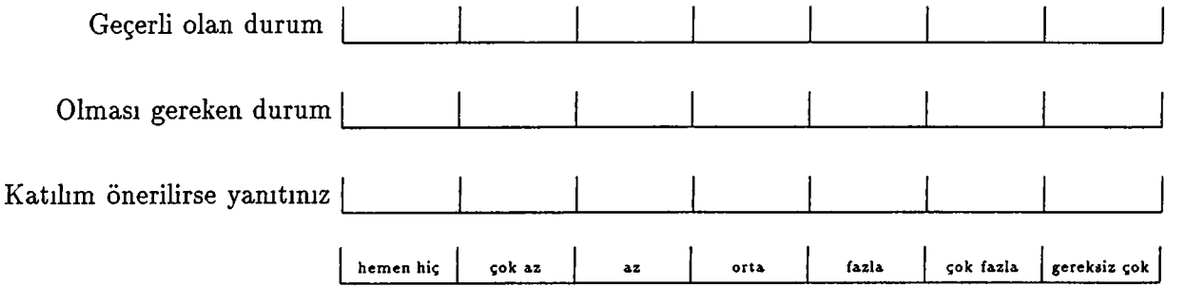
4. Sistemin tasarım aşamasında toplantılardaki soru-yanıt akışında, bilgi işlem çalışanlarından ziyade, siz (ya da kullanıcı grubunuz) ne derecede yönlendirici oldunuz ?



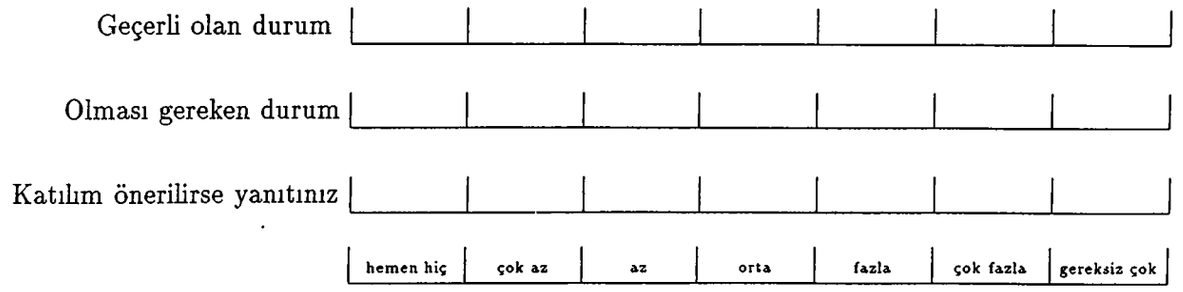
5. Sistemin tasarım aşamasında doğru ihtiyaç ve hedeflerin belirlenmesinde, asıl sorumluluk, bilgi işlem çalışanlarından ziyade, ne derecede size (ya da kullanıcı grubunuza) aitti ?



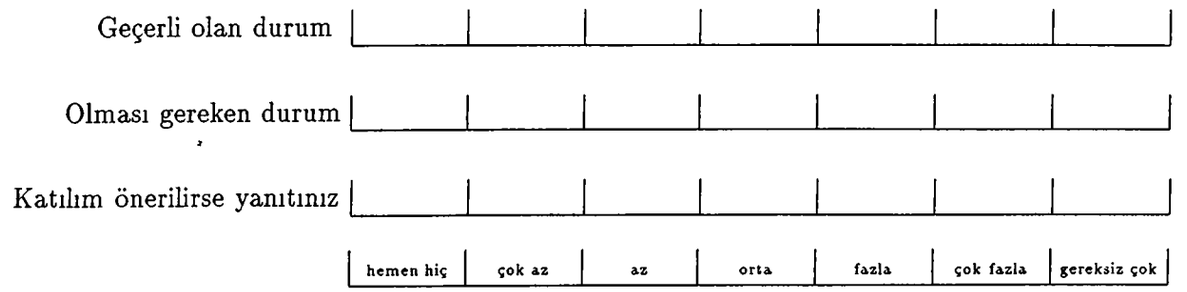
6. Tasarım ve plan aşamasında bilgi işlem çalışanlarına göre, siz (ya da kullanıcı grubunuz) ne dereceye kadar etkin rol aldınız ?



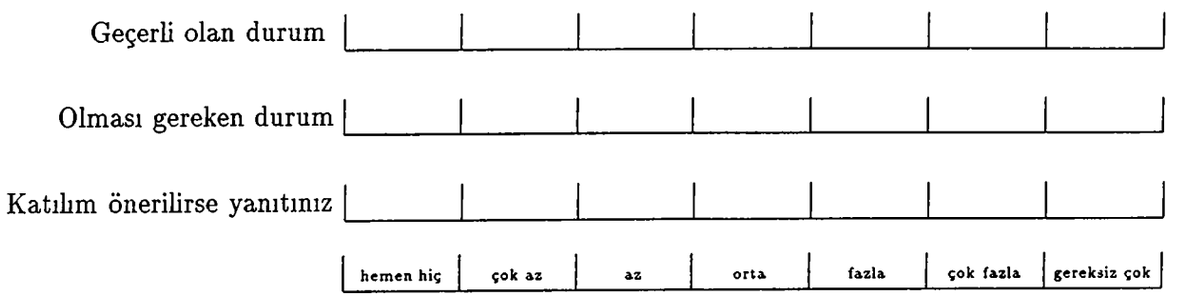
7. Sistemin uygulamaya geçiş aşamasında bilgi ihtiyaçlarının belirlenmesinde, bilgi işlem çalışanlarından ziyade, siz (ya da kullanıcı grubunuz) ne dereceye kadar etkin rol aldınız ?



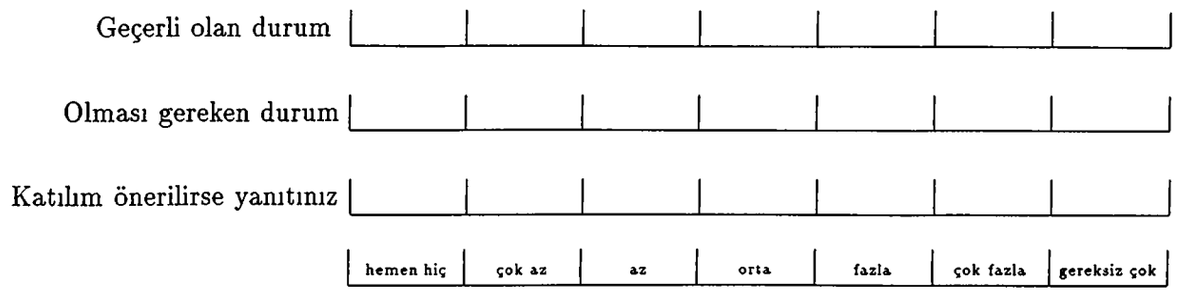
8. Sistemin uygulamaya geçiş aşamasında, girdi ihtiyaçlarının belirlenmesinde, bilgi işlem çalışanlarından ziyade, siz (ya da kullanıcı grubunuz) ne dereceye kadar etkin rol aldınız ?



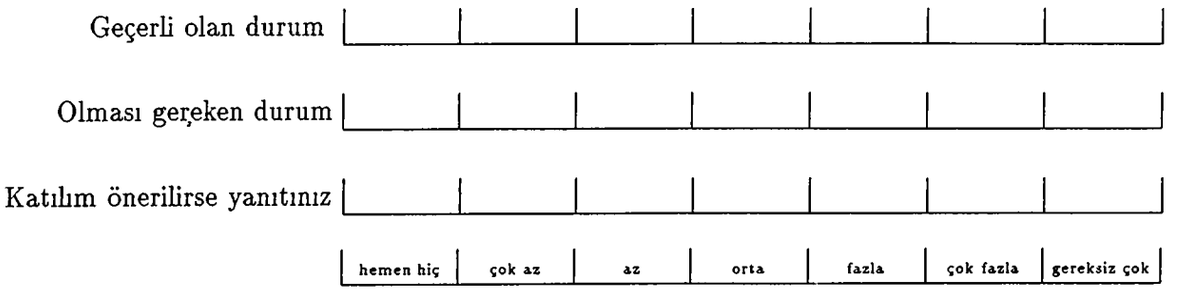
9. Sistemin uygulamaya geçiş aşamasında, çıktı ihtiyaçlarının belirlenmesinde, bilgi işlem çalışanlarından ziyade, siz (ya da kullanıcı grubunuz) ne dereceye kadar etkin rol aldınız ?



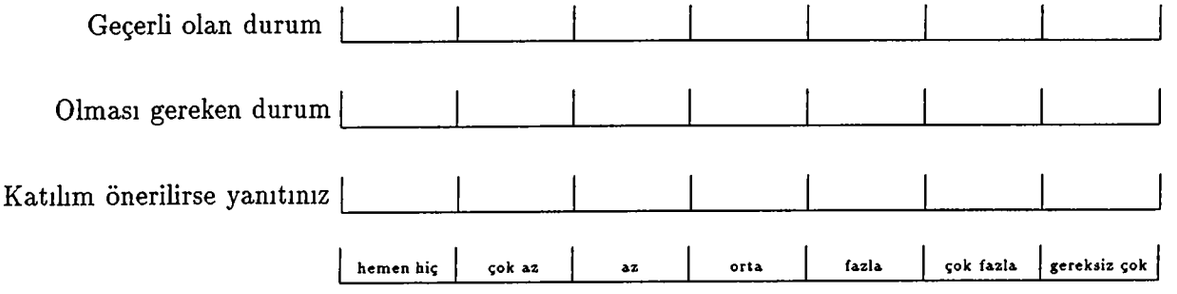
10. Sistemin uygulamaya geçiş aşamasında, toplantılardaki soru-yanıt akışında, bilgi işlem çalışanlarından ziyade, siz (ya da kullanıcı grubunuz) ne derecede yönlendirici oldunuz ?



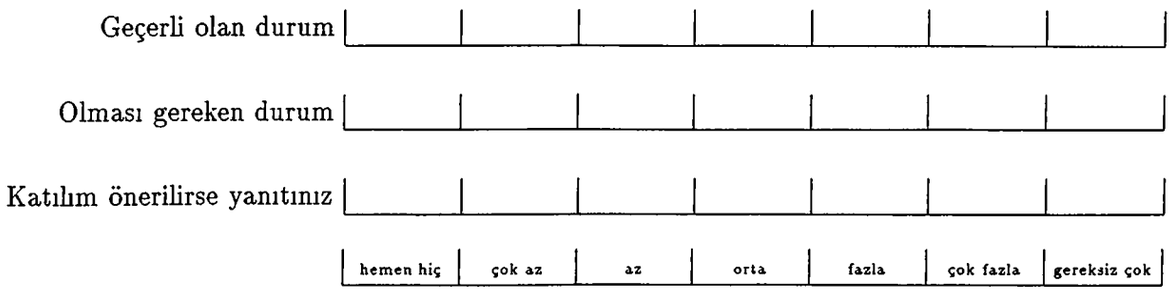
11. Sistemin uygulamaya geçiş aşamasında hedeflere ulaşılıp ulaşılmadığının kontrolündeki asıl sorumluluk, bilgi işlem çalışanlarından ziyade, ne derecede size (ya da kullanıcı grubuna) aitti ?



12. Sistemin uygulamaya geçiş aşamasında teknik özelliklerin belirlenmesinde bilgi işlem çalışanlarına göre, siz (ya da kullanıcı grubunuz) ne dereceye kadar etkin rol aldınız ?



13. Uygulamaya geçiş aşamasında, sistemin test edilmesinde bilgi işlem çalışanlarına göre, siz (ya da kullanıcı grubunuz) ne dereceye kadar etkin rol aldınız ?



14. Bilgi işlem merkezinde şube elemanlarından oluşan ve sistemdeki uygulamaların test edilmesiyle görevli olarak çalışan UYGULAMA TEST adlı birimle ilgili bilginiz var mı?

| Evet | Hayır |

15. Uygulama test biriminde çalışmanız önerilirse yanıtınız ne olur ?

| Evet | Hayır |

16. Daha önce kullanılan bilgisayar sistemiyle ilgili olarak öneri mektubu yazdınız mı ?

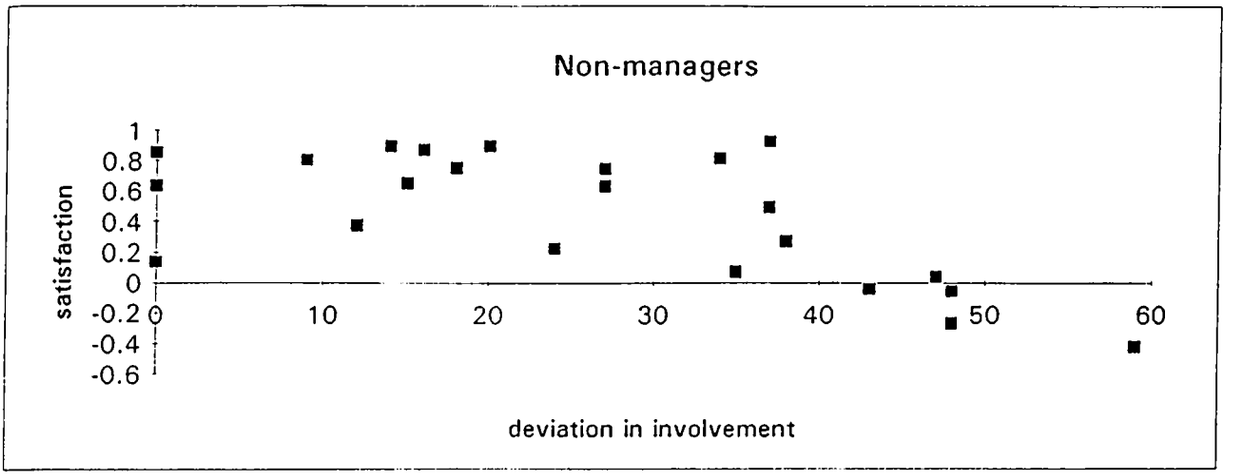
| Evet | Hayır |

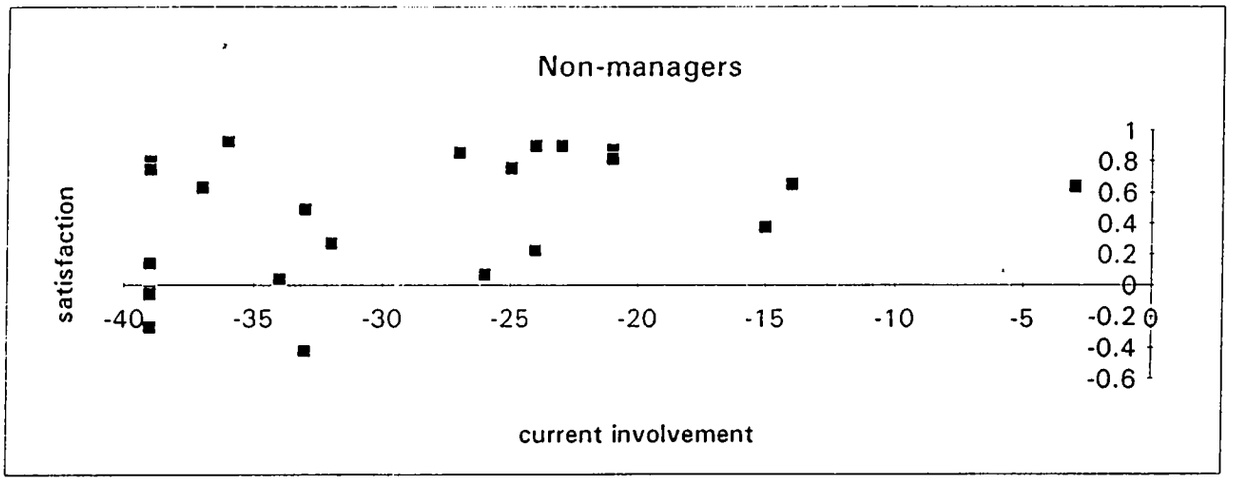
17. Yazdığınız öneri mektuplarına olumlu yanıt aldınız mı ?

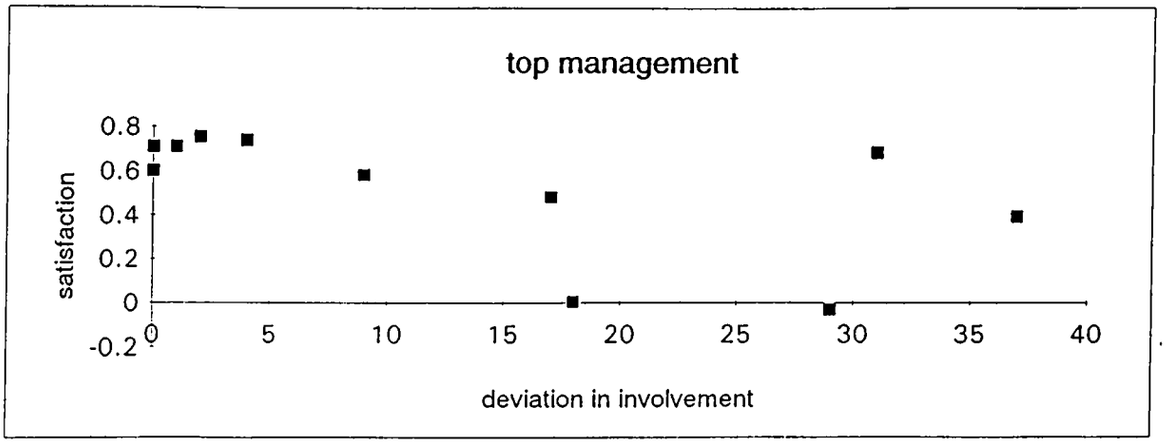
| Evet | Hayır |

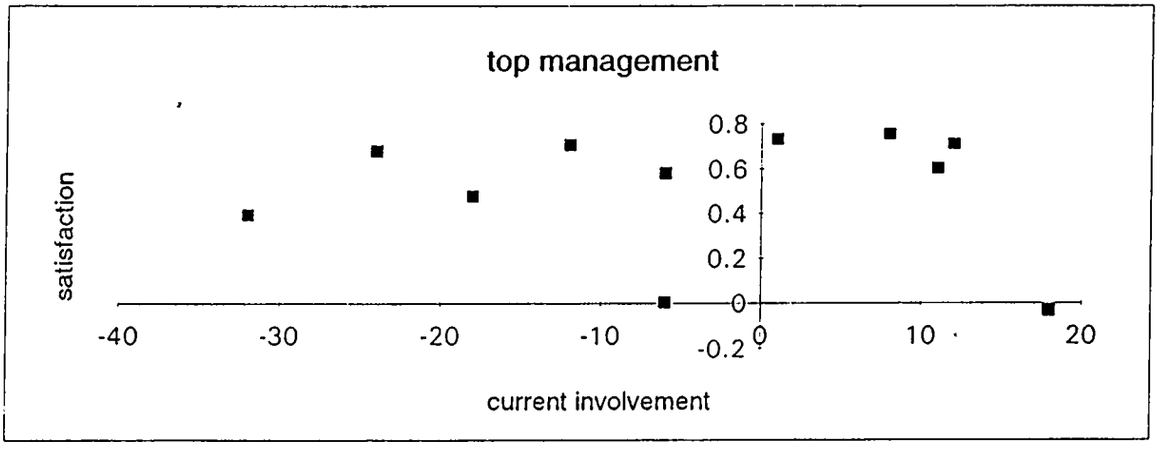
APPENDIX B

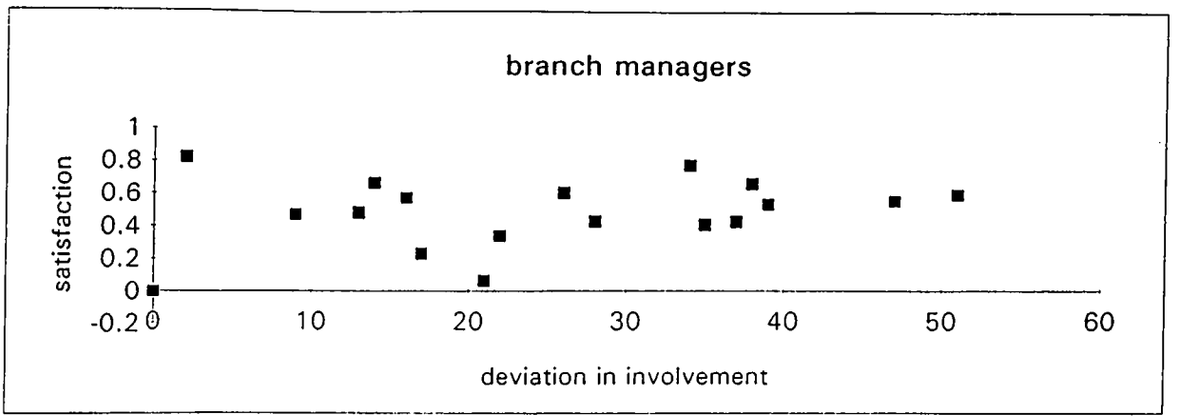
Scattered Diagrams of Responses to the Questionnaires

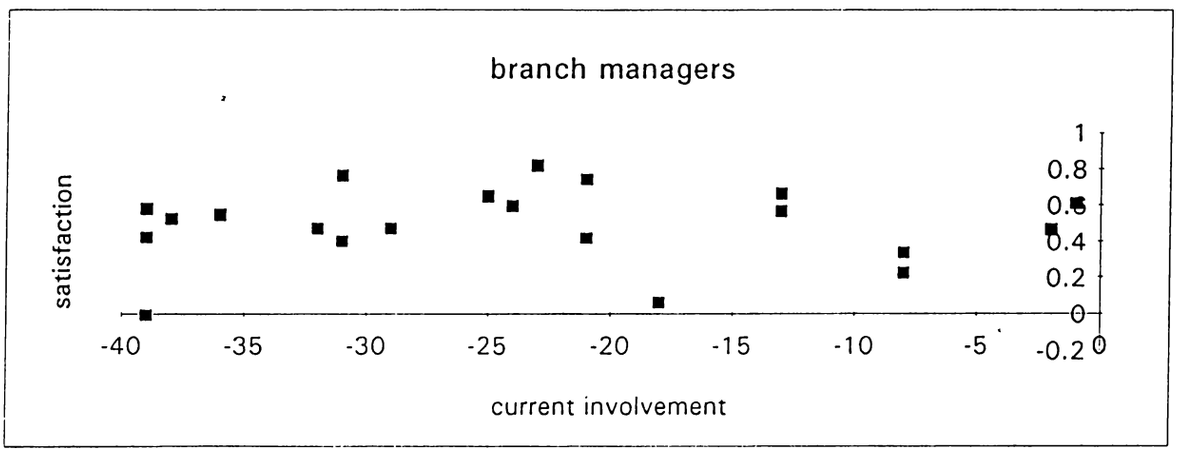

Non-managers
satisfaction
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
0
10
20
30
40
50
60
deviation in involvement

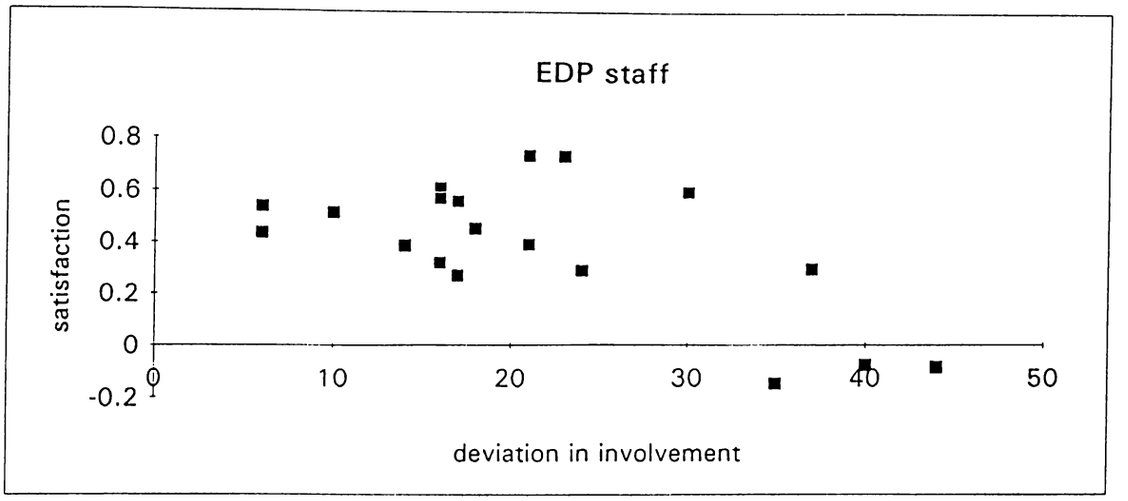

Non-managers
satisfaction
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-40
-35
-30
-25
-20
-15
-10
-5
0
current involvement

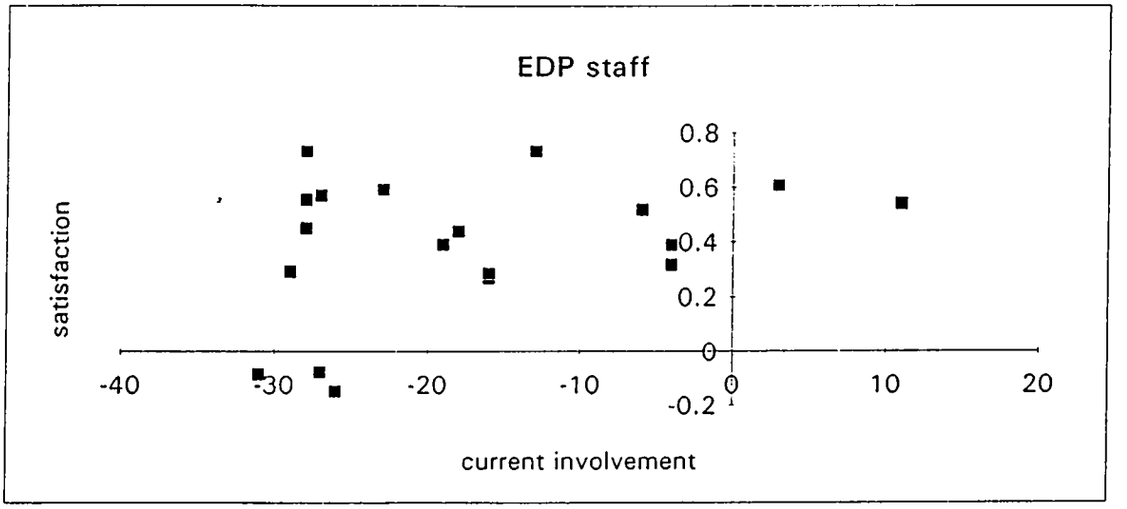

top management
satisfaction
0.8
0.6
0.4
0.2
0
-0.2
0
5
10
15
20
25
30
35
40
deviation in involvement

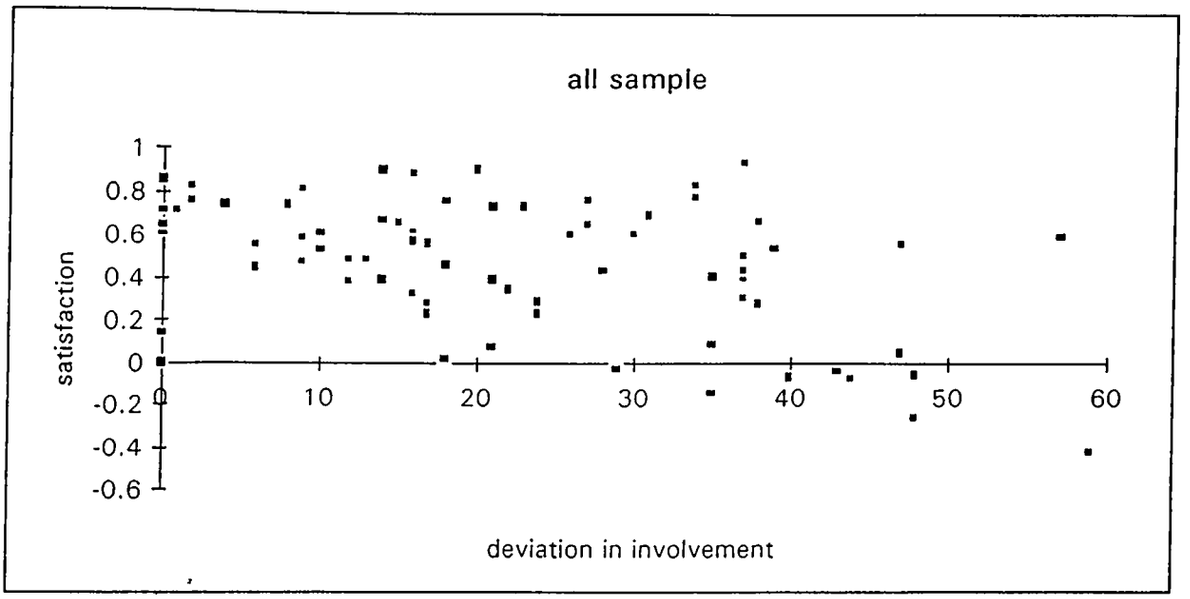

top management
satisfaction
0.8
0.6
0.4
0.2
0
-0.2
-40
-30
-20
-10
0
10
20
current involvement

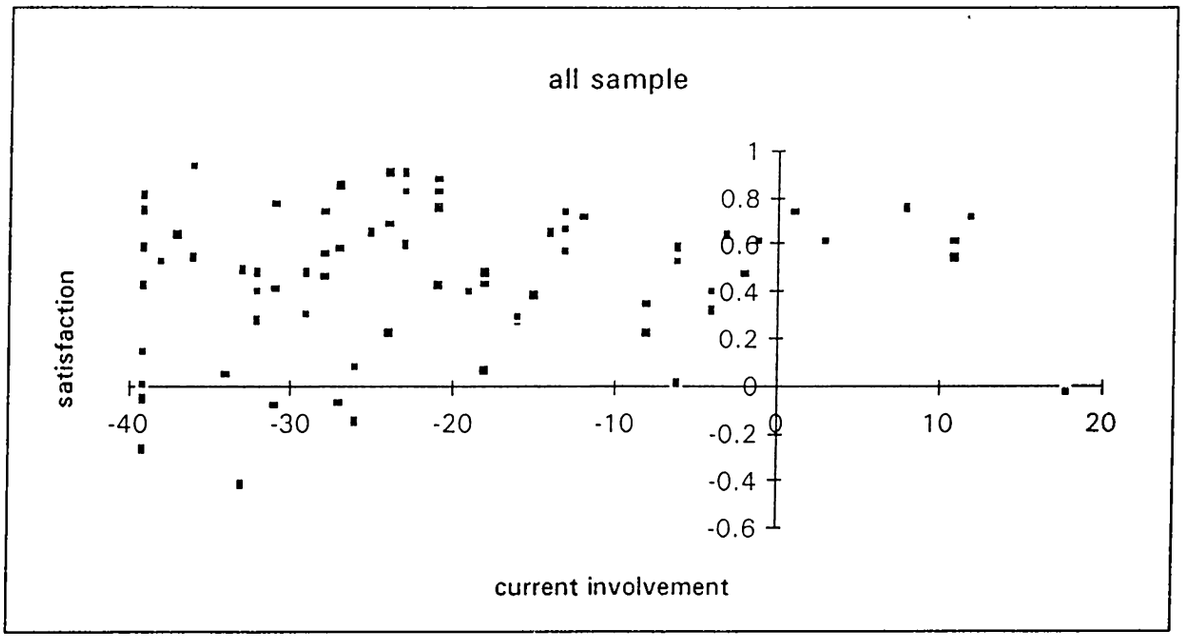

branch managers
satisfaction
1
0.8
0.6
0.4
0.2
0
-0.2
0
10
20
30
40
50
60
deviation in involvement


branch managers
satisfaction
1
0.8
0.6
0.4
0.2
0
-0.2
-40
-35
-30
-25
-20
-15
-10
-5
0
current involvement


EDP staff
satisfaction
0.8
0.6
0.4
0.2
0
-0.2
0
10
20
30
40
50
deviation in involvement


EDP staff
satisfaction
0.8
0.6
0.4
0.2
0
-0.2
-40
-30
-20
-10
0
10
20
current involvement


all sample
satisfaction
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
0
10
20
30
40
50
60
deviation in involvement


all sample
satisfaction
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-40
-30
-20
-10
0
10
20
current involvement

APPENDIX C

Regressions Data

Regression Statistics — deviation from expected involvement level

Multiple R	0.57238
R Square	0.32762
Adjusted R Square	0.25291
Standard Error	0.24403
Observations	11

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	1	0.2611494	0.261149	4.385321	0.065743
Residual	9	0.5359574	0.059551		
Total	10	0.7971068			

	Coefficients	*Standard Error*	*t Statistic*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0.66886	0.1053721	6.347645	8.38E-05	0.430496	0.907233
x1	-0.0117	0.0056062	-2.09412	0.062694	-0.02442	0.000942

Regression Statistics — current involvement level

Multiple R	0.08289
R Square	0.00687
Adjusted R Square	-0.1035
Standard Error	0.29658
Observations	11

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	1	0.0054766	0.005477	0.062263	0.808555
Residual	9	0.7916302	0.087959		
Total	10	0.7971068			

	Coefficients	*Standard Error*	*t Statistic*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0.50456	0.0929747	5.4268	0.00029	0.294232	0.714879
x1	-0.0015	0.0058338	-0.24953	0.808004	-0.01465	0.011741

Regression Statistics deviation from expected involvement level

Multiple R	0.64825
R Square	0.42023
Adjusted R Square	0.38612
Standard Error	0.20236
Observations	19

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	1	0.5045908	0.504591	12.32176	0.002684
Residual	17	0.6961701	0.040951		
Total	18	1.2007608			

	Coefficients	*Standard Error*	*t Statistic*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0.71823	0.1049216	6.845436	2.09E-06	0.496869	0.9396
x1	-0.0153	0.0043497	-3.51024	0.002499	-0.02445	-0.00609

Regression Statistics current involvement level

Multiple R	0.31927
R Square	0.10193
Adjusted R Square	0.04911
Standard Error	0.25186
Observations	19

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	1	0.122397	0.122397	1.929543	0.182738
Residual	17	1.0783638	0.063433		
Total	18	1.2007608			

	Coefficients	*Standard Error*	*t Statistic*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0.50488	0.1021009	4.944923	0.000105	0.289467	0.720295
x1	0.00675	0.0048614	1.38908	0.181756	-0.0035	0.017009

Regression Statistics deviation from expected involvement level

Multiple R	0.1361
R Square	0.0185
Adjusted R Square	-0.0331
Standard Error	0.2142
Observations	21

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	1	0.0164533	0.016453	0.358453	0.556438
Residual	19	0.8721153	0.045901		
Total	20	0.8885686			

	Coefficients	*Standard Error*	*t Statistic*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0.4463	0.0889792	5.016084	6.62E-05	0.260091	0.632563
x1	0.002	0.0032984	0.598709	0.556088	-0.00493	0.008879

Regression Statistics current involvement level

Multiple R	0.024
R Square	0.0006
Adjusted R Square	-0.052
Standard Error	0.2162
Observations	21

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	1	0.0005125	0.000513	0.010965	0.917699
Residual	19	0.8880561	0.04674		
Total	20	0.8885686			

	Coefficients	*Standard Error*	*t Statistic*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0.5013	0.1034162	4.847308	9.77E-05	0.284837	0.717743
x1	0.0004	0.003936	0.104715	0.917645	-0.00783	0.00865

Regression Statistics deviation from required involvement level

Multiple R	0.633239
R Square	0.400992
Adjusted R Square	0.372468
Standard Error	0.329303
Observations	23

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	1	1.52445353	1.5244535	14.05797	0.001181
Residual	21	2.27725068	0.1084405		
Total	22	3.80170421			

	Coefficients	*Standard Error*	*t Statistic*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0.860502	0.12941229	6.6493103	1.1E-06	0.591375	1.12963
x1	-0.01556	0.0041496	-3.7493961	0.001109	-0.02419	-0.00693

Regression Statistics current involvement level

Multiple R	0.366787
R Square	0.134532
Adjusted R Square	0.09332
Standard Error	0.395827
Observations	23

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	1	0.51145252	0.5114525	3.264341	0.085153
Residual	21	3.29025169	0.1566787		
Total	22	3.80170421			

	Coefficients	*Standard Error*	*t Statistic*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0.896496	0.26095635	3.4354255	0.002363	0.353808	1.439185
x1	0.01554	0.00860104	1.8067487	0.0845	-0.00235	0.033427

Regression Statistics deviation from expected involvement level

Multiple R	0.446391
R Square	0.199265
Adjusted R Square	0.188144
Standard Error	0.275745
Observations	74

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	1	1.362358	1.362358	17.91739	6.708E-05
Residual	72	5.474556	0.0760355		
Total	73	6.836914			

	Coefficients	*Standard Error*	*t Statistic*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0.657984	0.05774	11.39564	7.26E-18	0.5428814	0.773086233
x1	-0.009128	0.002156	-4.232894	6.62E-05	-0.013427	-0.00482925

egression Statistics current involvement level

Multiple R	0.169501
R Square	0.028731
Adjusted R Square	0.015241
Standard Error	0.303692
Observations	74

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	1	0.196429	0.1964289	2.129797	0.1488092
Residual	72	6.640485	0.092229		
Total	73	6.836914			

	Coefficients	*Standard Error*	*t Statistic*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0.528817	0.061852	8.5497	1.3E-12	0.4055174	0.652117335
x1	0.003597	0.002464	1.4593823	0.14875	-0.001316	0.008509308

8 REFERENCES

Alter S.L., "How effective Managers Use Information Systems," *Harvard Business Review*, Nov-Dec 1976, pp97-104.

Bailey J.E., W.S. Pearson, " Development of a Tool for Measuring and Analyzing Computer User satisfaction," *Management Science*, 29:5, May 1983, pp530-545.

Barki H., J. Hartwick,"Rethinking of the Concept of User Involvement," *MIS Quarterly*, March 1989, pp53-63.

Baroudi J.J., Olson M.H. and Ives Blake, " An Empirical Study of the Impact of User Involvement on System Usage and Information Satisfaction," *Communications of the ACM*, 29:3, March 1986, pp232-238.

Batiste L.J., T.J. Jung "Requirements, Needs and Priorities ; A Structured Approach for Determining MIS Project Definition," *MIS Quarterly*, Dec 1984, pp215-227.

Brophy, P. *Management Information and Decision Support Systems in Libraries* Hants: England 1986.

Cash, McFarlan, McKenney *Corporate Information Systems Management: The Issues Facing Senior Executives*, 1992 IRWIN.

Cheon MJ, V. Grover and R. Sabherval , " The Evolution of Empirical Research in IS: A Study in IS Maturity," *Information and Management*, 24, 1993, pp107-119.

Culnan M.J., E.B. Swanson,"Research in Management Information Systems 1980-1984: Points of Work and Reference," *MIS Quarterly*, 1986, pp289-302.

Davis, G.B. "Information Systems as an Academic Discipline," presented at the Conference on the Intellectual Foundations for Information Professionals, Emporia State University, Emporia, Kansas, November 15-18, 1984.

DeBrabander B., A. Edstrom"Successful Information Systems Development Projects," *Management Science*, 24:2, 1977, pp191-199.

DeBrabander B., G. Thiers, "Successful Information System Development in Relation to Situational Factors ...,"*Management Science*, 1984, pp137-155.

Dickson, G.W., J.K. Simmons "The Behavioral Side of MIS," *Business Horizons*, 13:4, August 1970, pp1-13.

Doll J.W. "Avenues for Top Management Involvement in Successful MIS Development," *MIS Quarterly*, March 1985, pp17-35.

Edstrom, A.,"User Influence and the Success of MIS Projects," *Human Relations*, 30, 1977, pp589-606.

Franz C.R., D. Robey "Organizational Context, User Involvement, and the Usefulness of Information systems," *Decision Sciences*, 17, 1983, pp329-355.

Ginzberg, M.J., "Early Diagnosis of MIS Implementation Failure ", *Management Science*, 27:4, April 1987, pp.459-477.

Grudin J. "Obstacles to User Involvement in Software Product Development, with implications for CSCW," *International Journal of Man-Machine Studies*, 1991, pp435-352.

Hawk S.R., R.J. Aldag, " Measurement Biases in User Involvement Research," *OMEGA International Journal of Management Science*, 18:6, 1990, pp605-613.

Hiltz R.S., K. Johnson , "User Satisfaction With Computer -Mediated Communication Systems," *Management Science*, 36:6, June 1990, pp.739-765.

Ives B., M. Olson , "User Involvement in System Design: An Empirical Test of Alternative Approaches" , *Information and Management*, 4, 1981, pp183-195.

Ives B., M. Olson, "User Involvement and MIS Success," *Management Science*, 30:5, May 1984, pp586-603.

Jenkins A.M. "Research Methodologies and MIS Research," *Research Methods in Information Systems*, 1985, pp103-117.

Kendall K.E., J.R. Buffington and J.E. Kendall "The Relationship of Organizational Subcultures to DSS User Satisfaction," *Human Systems Management*, 7, 1987, pp31-39.

Lee S.A., "A Scientific Methodology for MIS Case Studies," *MIS Quarterly*, March 1989, pp33-50.

Lucas, H.C., JR. " The Evolution of an Information System : From Key-Man to Every Person," *Sloan Management Review*, Winter 1978, page 43.

Mansuy J.E., "Evolutionary Development Strategy for MIS," *Journal of Systems Management*, July 1989, pp7-13.

Markus M.L., "Power, Politics, and MIS Implementation," *Communications of the ACM*, 26:6, June 1983, pp430-444.

Mathieson K., "Measuring User Satisfaction ," *Interfaces*, 16:6, Nov-Dec 1986, pp73-76.

McAulay, K., "The Changing Role of Management in Information Systems Development," *Interfaces*, 17:3, May-June 1987, pp47-53.

Melone, N.P. "A theoretical Assessment of the User Satisfaction Construct in Information Systems Research," *Management Science*, 36:1, Jan 1990, pp76-91.

Nath R., "Are Frequent Computer Users More Satisfied ?," *Information Processing and Management*, 25:5, 1989, pp557-562.

Naylor, T.H., "Decision Support Systems or Whatever Happened to MIS ?," *Interfaces*, 12:4, 1982, pp92-94.

Nutt P.C., " Evaluating MIS Design Principles," *MIS Quarterly*, June 1986, pp139-155.

Premkumar G.,"An Empirical Study of IS Planning Characteristics Among Industries," *OMEGA International Journal of Management Science*, 1992, pp611-629.

Powers R.F., G.W. Dickson, "MIS Project Management : Myths, Opinions, and Reality," *California Management Review*, 15:3, 1973, pp147-156.

Shank E.M., R.W. Zmud, "Critical Success Factor Analysis as as Methodology for MIS Planning," *MIS Quarterly*, June 1985, pp121-129.

Spiegler, I., "MIS and DBMS : Where Does One End or The Other Start ?," *Journal of Systems Management*, June 1980, pp34-42.

Swanson E.B., "Measuring User Attitudes in MIS Research : A Review," *OMEGA the International Journal of Management Science*, 10:2, 1982, pp156-165.

Watson J.H., M.M. Hill, "Decision Support Systems or What Didn't Happen With MIS," *Interfaces*, 13:5, Oct. 1983, pp81-88.

Wysong, M.E., "MIS in Perspective," *Journal of Systems Management*, Oct 1985, pp32-36.